

International Journal of Orthodontia and Oral Surgery

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VOL. 23

APRIL, 1937

No. 4

Orthodontia

PRESIDENT'S ADDRESS

SOUTHWESTERN SOCIETY OF ORTHODONTISTS

CURTIS W. WILLIAMS, SHREVEPORT, LA.

I WISH to thank the Southwestern Society of Orthodontists for the privilege of being your president for the past year. May I assure you that my work during the year and the preparation of the program have been beneficial as well as a source of much pleasure to me. I wish to express my appreciation to the members of the program committee and to our efficient secretary. They have worked untiringly and harmoniously to give you a program which we think cannot be excelled.

The Southwestern Society of Orthodontists was organized some sixteen years ago by a small group of men who were interested in the promotion and betterment of orthodontia. Some of these men have received the highest honors the specialty of orthodontia offers. It has been a source of great pleasure to me to have lived and to have been intimately associated with this group of men.

I think there is a friendship and fellowship existing in the Southwestern Society that does not exist in any other known organization of its kind. Some one has said, "Friendship is the ultimate social utopia." It is the gradual outgrowth of diminishing barbarism. Today it is the impelling force that is pushing mankind closer together toward the goal of more nearly perfect mental, moral, and social attainment. Its importance to civilized social life may be likened to the importance of the natural elements: earth, air, fire, and

Meeting held in Shreveport, La., Jan. 17-20, 1937.

water, upon the very existence of which human life depends. Bereft of the controlling influence of friendship, man would sink again to the primitive being of the prehistoric ages.

We have been very careful in the selection of our members, and I hope the men being initiated into our society will appreciate the value of true fellowship and live up to the high ideals, as set out by the ones responsible for its origin.

Our hearts are saddened as we record the passing of one of our honorary members, Dr. Albert H. Ketcham. Dr. Ketcham was a great influence in the early organization of our society. Many of us received council and encouragement in his office.

Dr. Ketcham was born in Whiting, Vermont, in 1870. He was a member of the following dental societies:

Denver Dental Association, Colorado State Dental Association, American Dental Association, American Society of Orthodontists, Rocky Mountain Society of Orthodontists, Honorary member of the Pacific Coast Society of Orthodontists, Southwestern Society of Orthodontists, and Southern Society of Orthodontists. He died December 6, 1935, of pneumonia.

The editorial in the *International Journal of Orthodontia and Oral Surgery* written by Dr. H. C. Pollock is a beautiful tribute to Dr. Ketcham. I am sure Dr. Pollock has ably expressed what is in our hearts today.

Usually the President has certain recommendations he wishes to present for the consideration of the society—either changing the old order of things or suggesting new ideas.

I have two or three suggestions to present for your consideration: First, there is one thing absolutely necessary to success—creative effort. He who would succeed must find a positive satisfaction in his work. Each year we have some man who has been outstanding in orthodontia and has originated some idea that will make our work easier and our lives happier. I feel it gives our society some prestige to show that we have men who we feel are deserving of such honor. This man should be honored by our society.

Second, in the past we have had no systematic method of referring our cases to other orthodontists for continued treatment. I have the following system to offer: When a patient is to be transferred to an orthodontist of another city I think a letter should be written to this man introducing the patient to him. You might incorporate in this letter your financial agreement with the patient and personal remarks. After the patient has been received by the orthodontist who is to continue the treatment, he should in turn write saying the patient had presented for continued treatment. Now at this time record models, x-ray films, photographs, and other information that you think would aid in the treatment should be sent.

I offer this suggestion for your consideration with criticism. If this method does not meet with the approval of the society, I would suggest that the incoming president be instructed to appoint a committee to work out a uniform method of referring patients.

It has been suggested to me by one of our members that I implore our membership to join the American Society for the Promotion of Dentistry for

Children. This society is doing a fine piece of work for children's dentistry and, incidentally, orthodontia. This effort will in time help solve the problem of orthodontia service for the indigent groups, by intercepting malocclusion rather than restoring cases to normal.

Our constitution and by-laws seem to be adequate for our needs at the present time. If we are to become an associate member of the American Society of Orthodontists, then our constitution can be amended to take care of our new activities.

You will note in our program several committees have been appointed. I wish to refer to one important committee, the Educational and Public Relations Committee. This committee is supposed to look into and keep in touch with the federal and state legislation, or we might say the socio-economic phase of dental practice.

Members of our society were a great influence in the passing of laws in several states. I wish to call your particular attention to one state: the Oklahoma Dental Act which places all the specialties under a licensing system and prohibits orthodontic practice through commercial laboratories. I think this is a good law, and I hope our entire membership will not be content until we have such a law in every state.

Last year at this time we were in the most crucial stages of our campaign against the commercial orthodontia laboratory treatment service advertisements in dental journals. During the past year it may be pointed out that two commercial journals having the largest circulation of any similar type of journal in the world have agreed to discontinue the acceptance of this kind of unethical orthodontia advertising. One or two other journals have promised to discontinue this type of advertising after their present contracts have expired. These highly constructive movements were originally sponsored by the Southwestern Society of Orthodontists and carried to a successful conclusion by members of our society. Our organization can rightly claim credit for them.

We have guests with us who have given much time and thought to the intricacies of orthodontia, and we feel honored that these men will quit their busy offices and come here to tell us the things they themselves have worked so hard to get. I speak of Dr. Oren A. Oliver, Dr. William R. Humphrey, Dr. S. D. Gore, and our own Dr. E. B. Arnold. All willingly accepted our invitation to be on our program. I know I speak the thoughts of our members when I say we feel honored in having you.

Now I wish to welcome all of you to Shreveport.

This meeting has no higher purpose than to be a clearing house for your problems, and when you have returned home, I hope you can say: "My money and time have been well spent, and I am a better orthodontist for having attended the Shreveport meeting."

THE ADVANTAGES OF EARLY TREATMENT OF MALOCCLUSION

FRANK A. DELABARRE, D.D.S., M.D., F.A.C.D., BOSTON, MASS.

IT IS assumed that orthodontia is primarily a health service, since its major objective is the maintenance or restoration of the complex oral functions. It closely parallels dental health service, which is concerned with the health of the individual units. Dentistry's point of attack is centered on the youngest child, since the incidence of caries appears soon after the eruption of the teeth. Orthodontia logically should make a similar early approach because malocclusion is frequently demonstrated in the deciduous dentition, not infrequently in complicated forms.

Under such conditions each service exhibits the highest possible preventive value in terms of health and function of this important field of the bodily economy, and the beneficial results exert a powerful influence for general health throughout life.

The dental profession recognizes its dependence upon the larger field of general medicine in caring for the prenatal and postnatal periods to the end that the child may come into our field of endeavor with the best possible physical equipment.

The White House Conference on Child Health and Protection recommended that the "whole child" should be appraised in any health service. Consequently the orthodontist's first effort should be to record the family and personal history.

A valuable aid to such routine procedure can be found in Dr. W. R. P. Emerson's book, *The Diagnosis of Health*, in which he lists the signs of physical fitness, and their opposites, in the endeavor to determine whether the child is "free to gain."

If the physical capacity for growth is below par because of existing handicaps, orthodontic treatment is contraindicated in spite of favorable circumstances in other respects. Such a situation may explain some of our failures.

Early orthodontic service should begin its study of growth and development of the occlusion of the individual child on the completion of the deciduous dentition, followed by periodic and systematic observation, using all the commonly accepted methods with particular emphasis on the study of oral function.

There is an unquestionable value in such a series of data over a period of time, which reveals the *trend* of growth and development in physiologic terms and discloses the early small departures from normal relationships and function, which is the starting point of most of the complicated malocclusions of later life. Thus the operator may proceed with a justified confidence when it becomes apparent that distorted form and malfunction are exerting an influence that will intensify the situation. This is advocated as rationally applicable to every child

Read as part of a symposium before the New York Society of Orthodontists, New York City, March 24, 1936.

as a measure against professional indifference, neglect or advice founded on ignorance. The known high incidence of malocclusion alone is sufficient reason.

An accepted diagnosis must be accompanied by a prognosis which considers not only the mechanical difficulties but, more important still, the conditions noted in the physical examination.

The debated question of treatment at an early stage of development or postponing it until later is up for consideration. The following reasons are submitted as justifying early treatment.

Its adoption will fulfill the complete responsibility of dentistry to the public; a child with a neglected malocclusion but with well-cared-for teeth or one with the conditions reversed is a reproach to the profession.

The systematic observation advocated will result in a more intelligent and dependable diagnosis and prognosis.

The early recognition of etiologic factors makes it possible to eliminate some of them before their influence becomes dangerous or impossible to control. This is particularly true of the many faulty functional habits not amenable to appliance treatment, such as breathing, speaking, mastication, sucking, posture, etc. Likewise, the daily routine of the child's life has a decided influence on his mental and physical development, and is consequently a matter of concern for the orthodontist, who should evaluate and balance the periods of work, both mental and physical, exercise, play, rest, and sleep that will tend to promote good health and a happy adjustment to his environment.

It is far better to maintain the integrity of an efficient balanced occlusion by preventive measures than to correct it.

Since the first departures from normal development are small in degree but none the less important as being violations of the basic requirements, the treatment is much simpler and shorter and the result is less liable to relapse because correct function has been reestablished. Normal function tends to maintain normal relationships and malfunction intensifies malocclusion. The gross complications characteristic of the old, neglected cases are avoided.

The lack of adequate width growth sufficient to accommodate the full complement of teeth in the arch curve is the most constant of all attributes of malocclusion. The period of natural acceleration of lateral growth begins in the early years of childhood and terminates at or about the transition period when the last deciduous teeth are lost. Therefore stimulation for added arch width is in harmony with nature's evident plan when applied early enough to permit the erupting permanent teeth to occupy their correct position in the arch curve unaided.

The esthetic results of early treatment are infinitely better than those in late treatment in which the facial appearance has been so disturbed by the intensification of the maldevelopment affecting the deeper structures as to render the final result in this respect unsatisfactory to the operator and disappointing to the patient. The early treatment and result allow full rein to the hereditary influence, concerning which we know so little, to follow its own mysterious pattern unrestricted by orthodontic interference.

The grossly complicated case of later life does at times result in distortions of the basic osseous structures of the jaws and face. The possibility of such oc-

currence is substantiated by L. W. Baker's experiments with the mutilated occlusions of animals which resulted in deflections of the bones of the skull itself. Landsberger of Berlin confirmed Baker's findings.

It should be noted that the desire of the patient and the parent is centered on the question of appearance, with little or no appreciation of our own principal objective of restored function.

The early treatment has removed the problem of inadequate arch width, established the correct anteroposterior relations of the arches, and placed the erupted teeth into correct position and relationship.

It is admitted that early treatment does not obviate the possible necessity of further treatment occasioned by the appearance of maldevelopment during the transition period when we expect an acceleration of vertical and anteroposterior growth. The added increment of anterior growth for the accommodation of the permanent molars is entirely out of our control by any known mechanical means. Nor is it rational to attempt to anticipate mechanically the full measure of vertical growth that is not appropriate development for the mixed dentition stage. In other words, treatment must not outrun nature's schedule of development.

The transition period is, to a degree, one in which any orthodontic treatment is contraindicated if the operative requirements antagonize the natural trend of development of the young adult dentition; for instance, if the incisors are to be moved forward, the use of the permanent molars for anchorage would prevent their natural forward migration and the development of the curve of Spee.

Furthermore stimulation for width growth of the arch is ineffective because of the absorption of the deciduous molar roots or the instability of the succeeding premolars.

If adequate arch width is not secured before the roots of the deciduous molars have absorbed to any extent, one must wait until the premolars can be used to secure that width.

Almost all malocclusions need arch width stimulation. It is wise to obtain it early.

The occurrence of width inharmony of the two jaws, present in all Class II and Class III cases, yields rapidly to simple, gentle force in the young child, and in many cases normal anteroposterior relations are established without the use of elastics.

The same applies to crossed bites.

Compared with the same situation in the twelve-year-old child, there is a great saving in time, effort, comfort, and expense.

The use of space maintainers, preferably the Willett type that gives a degree of occlusal function, is a certain insurance against the migration of the neighboring teeth.

The deflection of the permanent successor or, worse still, its impaction is inexcusable. The spontaneous correction of such an occurrence is rare indeed.

The argument for self-correction is lacking in adequate proof. No volume of such cases has been shown, and the evidence in support is weak.

To advance it as an argument against early treatment is ridiculous in the face of the high occurrence of malocclusion in young adults. The percentage

is against it in the first place, and the instability of any malocclusion logically leads to an ever increasing degree of malocclusion.

The early approach to malocclusion does not contemplate nor advise continuous treatment from the beginning up to the age of fifteen years or thereabout. It is beside the question to base an argument against the method on such an assumption.

The expense of early treatment is less as compared with the cases started later, because less operative and retainer time is required to overcome the smaller departures from the norm, and the gross complications common to the older case are absent. The observation time between periods of active treatment is longer, but the required chair time is small.

The preventive value of the early approach should not be underestimated. Its value is to be measured by the aid to health through function and the prevention of serious complications and disastrous results that come from neglect of positive handicaps. It is just as indefensible to neglect a positive young malocclusion as it would be for the dentist to neglect open cavities in the child under twelve years of age.

Any young occlusion that definitely violates any combination of the commonly accepted attributes of normal occlusion for the physiologic age of that child cannot be rationally described, as has been done, as merely "a phase of normal development."

There are many other manifestations of abnormality in the young child that should be corrected early. It is difficult to classify them and impossible to enumerate them all. The reasons advanced give a broad basis for a decision on any individual case.

The academic admonition that we do not know enough of a scientific nature about the growth and development of occlusion to justify treatment until such process has almost passed the time for completion is lacking in logic and common sense. The time element is vastly important. One may not deny that function determines form; that malocclusion tends to grow progressively worse with age; that the prognosis is less and less favorable with each added year.

The scientist is seldom the one best qualified to apply his newly found facts to methods of procedure. Edison was perhaps the most noted exception.

The specialty of orthodontia may modestly claim an intense and sincere interest in more fields of pure science than any other branch of our profession.

Give us more and more science, not less. Pure science must become applied science before it can be accepted as a practical aid.

The growth and development of occlusion are not fully understood, but in a broad sense the major succession of steps in orderly sequence, adapted to harmonize with the demands made by changes in age, structure, and size of the growing organism, is sufficient to found a practical, helpful procedure and to justify the correction of malocclusion at an early age.

Dr. E. A. Bogue of New York was the first to write extensively on early treatment of malocclusion and to him we owe a debt of gratitude. In closing let me quote from a letter written by him in 1920 just before his death: "My contention is that we should early, early begin to diagnose and correct, and in correction should consider the entire health of the child, and not the teeth alone. That is sound."

THE ADVANTAGES OF EARLY TREATMENT OF MALOCCLUSION

JOSEPH D. EBY, D.D.S., NEW YORK, N. Y.

I HAVE read an outline of Dr. Delabarre's paper with a great deal of interest and have prepared a few observations on the subject of treatment, with particular reference to the relative age of patients. These thoughts are the result of my own study, experience and observations over a period of many years, practically dating back to the advent of orthodontia as a specialty. The progress which has been made during this period has been so great that any one unfamiliar with the situation since 1903 would be quite astounded. This progress has been gradual and steady and readily absorbed by those who have participated in it. An analysis of this trend furnishes the finest evidence of the direction in which continued progress will go forward.

I have no pet hobbies to present, no hypothetical theories to build a foundation under, nor any radical dogmas to defend, so I can approach the theme in a calm and rational manner.

1. A successful result must follow successful treatment.
2. Successful treatment should follow an accurate diagnosis—or it has been accidental.
3. Diagnosis should be founded on science. Science is founded on facts.
4. Facts are revealed by research.

However much there may be of research, facts, science, and scope of diagnosis, all have but little if any value unless proved and substantiated by actual clinical results. If our primary object, then, is to achieve the uniformly best results over the widest range of cases, with reasonable assurances of success, the method actually employed comes under treatment. Volumes have been written on the range of difference between the chronologic and physiologic age of every person until complete growth is attained. It is foolish to call attention to the children who at the age of ten years have their full complement of permanent teeth including the third molars, or to those who at the age of fourteen years still possess several deciduous teeth. It is perhaps at this age that the widest range of difference is apparent—beginning with very little difference at the age of three years and with apparently very little difference at the age of twenty years. Admitting this range—increasing to its peak and again diminishing to its level—there can still be recognized an average dentition for each chronologic year, and these average years may also be placed into average age groups.

Read as part of a symposium before the New York Society of Orthodontists, New York City, March 24, 1936.

For convenience in expressing these thoughts, let us divide the average ages into groups as follows:

First group—three to six years.

Second group—six to eight years.

Third group—eight to twelve years.

Fourth group—twelve to twenty years.

The very foundation of life is built upon variation, and the physical agencies which deal with the formation and development of the deciduous and the permanent teeth and surrounding structures are infinite. How any one could expect to make a constant out of the laws of heredity, environment, nutrition, and function would be almost beyond conception.

Group 1.—For the first age group—from three to six years inclusive—it is my belief that one should exercise the most scrupulous care before making a decision to treat during this period. It is my practice to assume that treatment should not be voluntarily accorded at this time except in cases involving function. After making a careful study of an individual case to ascertain the condition at hand, I first endeavor to estimate whether or not it is worse than an average of its type. If it is a mild disturbance or less than an average condition, I follow the principle of placing the child under observation so as to note the future trend. If the case is worse than an average, it is my practice to make a further consideration and study with regard to treatment.

To me the principal conditions indicating treatment at this age would be extreme constrictions, extreme posterior occlusions, practically all mesiocclusions with interception of the maxillary incisors, conditions in which the maxillary and mandibular posterior deciduous teeth are out of occlusion on one or both sides, and what are commonly referred to as "cross-bites." Each of these conditions may be placed under the heading of "dysfunctional relationship." If through any of these media a certain portion of the face is going to be retarded in the direction of its growth, or if other portions are going to be overstimulated, and if there is going to be a break between muscular and occlusal balance, I personally would not wish to assume the responsibility for what might eventuate in the future without some early treatment. We can then summarize this first age group with the belief that treatment is indicated in conditions involving function, and that careful observation is indicated in milder forms.

Group 2.—In the second age group, from six to eight years inclusive, it is my practice and belief that, after careful study, treatment is frequently indicated up to the period when the roots of the remaining posterior deciduous teeth begin to absorb. Where there is lateral stimulation in certain neutroclusion conditions, in severe distocclusions, and in mesiocclusion, proper treatment may possess a preventive value equal to if not greater than the corrective value. I believe that it is possible for skillful care to produce results within a year's treatment during this period, which, if adequately retained and carefully sponsored, may save a much greater effort with less assurance of success later.

In these first two average age groups, effective treatment may be regarded as fundamental, inasmuch as we are not interested in the appearance of the pa-

tient nor in the deciduous teeth, but we are interested in the trend of growth of the substructures in which they are invested and the influence which correct function exerts on continued growth and development.

The moot question dealing with the premature loss of deciduous teeth and the resultant care of the spaces falls in this second average age group. It seems to me that the range of opinion varies from a total disregard of the spaces up to a total insertion of what are called "space retainers." It is my belief that totally to disregard these spaces is very dangerous and to insert space retainers in all of them is unnecessary. Of the two I should rather assume the responsibility for inserting the space retainer. If it is safe to say that a space retainer which is free at one end can do little or no harm, the same cannot be said for migrating teeth. By adopting a rational middle ground one can be prepared to proceed with either plan. It is my practice to put such cases under observation at first, and, if the interdigitation is well marked and normal and there are no disturbing occlusal stimuli so that the space remains open, then no interference is necessary. If there is evidence that predisposing agents are present, or if the space begins to close, then either active or passive control of the space is instituted.

I have in mind the condition in which the first permanent premolar is in contact with the first molar in a mandibular arch with the second premolar completely impacted, due to the loss of the second deciduous molar without further care. Such a mouth is generally entirely demoralized. Either the treatment of the case orthodontically or the removal of the imbedded premolar surgically is radical, and I personally would not wish to look back on the failure to maintain that space one way or another at the proper time.

It has been almost my universal observation that the premature loss of deciduous incisors at an age before the permanent teeth are well advanced invites inevitable collapse. In the care of such cases I believe in using a small active appliance which will meet the flexibility of growth and gradually open the space as the permanent tooth progresses. It is frequently observed for instance that a permanent lateral incisor will destroy a deciduous canine and occupy its space. I prefer to open at least partially the space and to prepare for the eruption of the permanent canine than eventually to be faced with the treatment of a condition in which three permanent teeth are occupying the space intended for only two.

There is a condition during this second age period in which a slightly radical measure will frequently produce splendid results. This is in those conditions in which there may have been several deciduous molars lost prematurely, and a radiographic survey reveals that the roots of the remaining deciduous teeth are absorbed and the oncoming permanent teeth well advanced. The removal of the remaining deciduous teeth will accelerate the eruption of the permanent premolars and canines, which will adjust themselves as they come into position, thus avoiding the possibility of future complications.

Group 3.—In the third average age group—from eight to twelve years of age, sometimes referred to as the "transitional period"—it has been my experience that perhaps the least amount of interference can be wisely made. Unless there is some such thing as a reversed relationship between the maxillary and the mandibular incisors, or something which might be referred to as a local

problem, any attempt at general treatment is something which I believe can be done much quicker and better when all the permanent teeth are erupted. It is my practice to avoid too much movement of permanent teeth in which the roots are unformed.

Group 4.—Emerging from this third average age group or transitional stage and beginning at the age of twelve or thirteen years, the general development of the dentition and of the face begins to present a more open problem. As facial growth ensues downward and forward as an ever-increasing process, the adult arch presents itself in a still growing face. In other words, the full volume of tooth substance and the relative conformation of the adult arch are present, but the ultimate volume and form of the adult face are still in the process of being made.

If it is true that by means of orthodontic appliances it is possible to mold growth or guide the direction of growth, then it would be a fallacy to assume that the "teen" years do not find that approach toward maturity in which interstitial growth activity has reached a stage and is proceeding at a degree of rapidity in which the final treatment can be accorded with the best success. The worst cases of malocclusion which have come under my observation have been those in the presence of the full dentition where it was only too obvious that a little treatment back in the first and second age group periods could have largely prevented the condition.

I am not prepared to quote definite figures, but I believe that it is safe to say that more than 80 per cent of the children of today possess a greater or lesser degree of malocclusion. We hear a great deal about leaving irregular conditions alone until the permanent dentition is formed, on the basis that they may be self-corrective. It has been my observation that conditions of definite malocclusion apparent at the early stages which develop unattended to the end of a practical result are in such small minority as to be more the exception than the rule. If, after careful study, early intervention is made which has done no good, it can certainly always be done in a manner which can obviously do no harm.

I believe there are conditions and stages of malocclusion which are treatable during every growing year, as it is also my belief that the study of any child's mouth should be approached with reverent care. It should embrace a study of the teeth, mouth, face, type of individual, inherent, and acquired tendencies, with a final summary of the organism into a working basis of thought in the experienced mind. Following this there should be a study of radiographic factors, a further study supported by casts, and then one should be able to sense in its finality whether treatment is obvious or not. It is a great satisfaction to prepare such records and place a child under observation at three- to six-month intervals. In this way it is easy to detect the rate and trend of growth in that particular individual, and truthful facts reveal themselves from behind that moot screen of conjecture beyond which no dogmatic ideas can penetrate. If there is the slightest question from a conservative aspect, this, to my mind, is the best avenue for the solution of the problems of diagnosis and the application of successful treatment.

It is my belief that orthodontia has passed beyond the realm of empiricism and is now in the realm where facts as revealed by research and experience make it possible for the application of treatment to be just as much a prescribed measure, at the proper age, in the proper amount, and with as much accuracy, as any other branch of the healing art. Let us view our problems in a rational and conservative way, and in so doing unselfishly mold the work to which we are devoted into a future in which the least amount of harm and the greatest amount of good can be our service to humanity.

For many years Dr. Delabarre has been a faithful champion of orthodontia and dentistry for children. I wish to express to him my appreciation of his views and his paper, and I hope it will receive a liberal discussion.

DISCUSSION ON SYMPOSIUM ON EARLY TREATMENT

Dr. Lowrie J. Porter.—I wish to congratulate Drs. Delabarre and Eby for their splendid sensible, and most timely presentation.

I am particularly pleased to note that they both seem to agree that treatment of orthodontic cases is purely a problem of stimulating growth at the time when the child should normally be getting that development, and that the time for orthodontic treatment can be judged only by individual development rather than by any age limit.

These papers were most interesting to me as I have been rather severely misunderstood recently in regard to my beliefs on the proper time for orthodontic treatment, because of an article published in the *New York Journal of Dentistry* over the names of Drs. Anderson, Kemple and myself.

That article, however, was explained in detail in the April issue of the *INTERNATIONAL JOURNAL OF ORTHODONTIA*, so I believe at present there can be no misunderstanding of beliefs.

It has always been my feeling that growth is our big problem and that we must instigate orthodontic treatment only in cases in which there is a decided lack of growth and that this should be given only at the time which seems most advantageous to growth.

Treatment of deciduous dentures should be given only to establish a normal functional relationship to allow nature a better chance to get normal development.

The movement of deciduous teeth will certainly not affect the position of the developing permanent teeth except as we may affect the entire alveolar processes through a stimulation of growth toward normalcy.

Some cases such as cross-bites, Class III cases and some cases of a very decided lack of lateral development should be treated in the deciduous dentures, but only at a time when these teeth have well-developed roots.

It is my sincere hope that we may some day have enough records of similar cases, both treated and untreated, so that we may be able to form some sort of a rational opinion as to which cases should or should not be treated, and also at what time treatment is most advantageous. Until that time it is my opinion that many of our decisions in regard to the time for treatment are good guesses but not well founded except perhaps by individual experience.

Dr. Leuman M. Waugh.—I have often expressed my opinion as being in favor of so-called "early treatment," but from time to time I have thought that I might perhaps select cases that had raised questions in my mind as to whether treatment might be instituted then, or whether it might be wise to wait a little time. I know that Dr. Delabarre and I have many things in common, among them being cautious in the institution of treatment in the early days on the basis that he so ably presented in his paper. However, I had been led to believe that as the result of a series of case studies conducted in the Forsyth Clinic he was reversing his opinion, and I came here today expecting that he was going to tell me that he had been all wrong and had seen a newer light; so I have here a few cases which I brought

for the purpose of asking questions of you as to what you would do with them, and perhaps tell you what I would do with them. However, I find that Dr. Delabarre and I are, perhaps, as much in accord as ever we were.

I am going to show a few cases, with the interrogation I use in practice: "What would I do if this were my child? Would I start to treat or would I wait a little while?"

(Slide) This is the case of a child seven years of age. The mandibular permanent incisors are in position, but not in normal position. What would you do with this case if it were your own child? This is what I did: I made casts, photographs, and a complete set of radiograms. I have made radiograms and photostatic photographs during the past three years. During the last two years I also made gnathostatic casts. You ask, "Why gnathostatic casts?" True, there are other methods. But casts should be made so that the relationship of the teeth in the cranium will be determined as nearly as possible. The Frankfort horizontal is the most constant plane from which to reckon. That is the method I am following now.

What else would you do? I certainly would not insert an appliance in the mouth at this age if by other means I could stimulate jaw growth. I subscribe most heartily to what was said about not letting an abnormality progress. Nature tries to harmonize (but she is compelled sometimes to harmonize to an abnormality. All nature's efforts are not to harmonize to the normal; so nature sometimes has no alternative but to harmonize to the abnormal. I would see this patient periodically, perhaps four times a year, and observe the growth tendency, and advise the use of exercisers, such as the bite strap, the odontobel, and rugged chewing.

When treat these cases? Dr. Eby has just said that there is a group growing up among the members of the general profession who feel that teeth should not be given orthodontic treatment until the thirteenth or fourteenth year. I am going to show some cases later, and I am then going to ask whether those patients would not have been better off if they had received treatment during the period of eruption.

What do I mean by so-called "early treatment"? T. Wingate Todd tells us that the period of most rapid horizontal growth of the jaws is from the twenty-first day after birth until the seventh month after birth; in other words, until the time that the first deciduous incisors are beginning to erupt; that this is followed by a period of comparative slow growth until about four and one-half years of age, when there is an acceleration of horizontal growth, extending until about the seventh year. Therefore, the second greatest period of horizontal growth of the jaws takes place from four and one-half to seven years of age. That is the age in which these important questions of treatment must be decided. From about eight or eight and one-half to ten years is not usually a good time to stimulate lateral growth in the jaws for the reason that the roots of the deciduous molars are sufficiently resorbed by this time, and if we use any measures to stimulate lateral growth by moving those teeth buccally, we are inclined to move those partly resorbed roots laterally across the body, and without moving the alveolar process outward; whereas, if we work earlier, it would tend to carry the deeper parts of the alveoli, the apical bases of the teeth, outward, and, I like to believe, also the follicles of their permanent successors; so if we want earlier treatment it should be carried along and be almost completed at this stage of development at eight years of age, and then all appliances should be removed, and if the dental arches have grown large enough the child should be excused from appliance treatment until he is ten or eleven years old; in the meantime he is examined periodically so that the orthodontist can check up on the progress that is being made. That is the procedure I have followed for the past twenty years; though in some cases I have probably inserted appliances in the mouth earlier than I would today.

(Slide) The maxillary casts are not so bad. Only the mandibular incisors are crowded. This case I believe would have a good chance to take care of itself. There are fairly broad molars in mesiodistal width, very small deciduous cuspids, but I think they will adjust themselves distally and with narrower bicuspid form a normal size dental arch. I am talking only of cases in which the mandible is in its proper relationship to the cranium; I am not talking about Class II and Class III cases. Treatment in those cases, I feel, should be begun earlier than in the so-called Class I cases. This case I expect would be taken care of without appliance therapy, but I would watch it and prescribe some form of treatment.

(Slide) Here is a child eight and one-half years of age. What would I do with this one? These casts are gnathostatically made. Here the permanent lateral incisors are locked very much to the lingual side in a generally narrowed arch. If I had seen this child at six years, I think I would have worked perhaps for a year in an endeavor to move the teeth, to broaden the arch, to stimulate growth of the arch without appliances, but I certainly would not have waited until this point before instituting appliance therapy. I certainly should have inserted a lingual arch with auxiliary springs for lateral growth. You can see how much smaller the whole lingual arch was. Dr. Bogue was right, I feel, when he said that the width between the deciduous molars was within a millimeter or two of the permanent one. I think it is a good guide of the width of the permanent arch in that same area. In other words, the measurement is not very far wrong from that of the premolars. It is surprising what twelve months of treatment will do in a case of this sort. I like to see the permanent first molars locked properly soon after they erupt. We should make every effort to have that occur because they are such important teeth, for three principal reasons: (1) They maintain the mandible in its proper relationship to the cranium. (2) They gradually take on the function of mastication when the deciduous roots are being resorbed and the patient bites with less force and masticates less thoroughly. (3) They are the largest and most important teeth in the whole mouth. They should be in place early and maintained in health and efficiency.

What has been said about space retainers I, of course, subscribe to. Here is a case that after, say, nine or twelve months of effort without appliances, I should have treated with appliances before it grew to this point. Treating with appliances is very simple. It does not mean that appliances are worn much more than just that one year.

(Slide) It is the mandibular teeth that seem to be our great guide as to whether treatment is needed or not. The maxillary teeth show the difference much less readily than the mandibular teeth. Here you see this does not show so very badly, and the two arches will need to harmonize; but so often in these cases in which the teeth are nicely locked an appliance in the mandibular arch is all that is needed, and then the patient should be urged to masticate thoroughly, and the maxillary teeth will very often move out with the mandibular teeth.

(Slide) This patient is nine years of age. I am going to ask the question: Do you not think it would have been better if something had been done for that patient before she was nine years of age? It seems to me that it is too much to expect nature to take care of all this. That case has never been treated. The cuspids are naturally lost. There has not been an appliance in this mouth. Sometimes the cuspids are lost much earlier if appliances have been in, but I do not think that is very serious, all other things being equal.

(Slide) Here is decided asymmetry. I am going to put the mandibular cast of that case on the slide. This is a gnathostatic cast. You see that this form of making a cast shows the relationship of the jaws in the cranium. You can see how much this jaw is to one side. See how little of the alveolar process shows back of the deciduous molar and how far it is from the other side. That shows the jaw is that much out of the median line in the cranium. It is wise to know about that, and as we take these successive casts of patients during a number of years many of us will have quite a collection which we can go over, and something can be told about what may or may not be done with these casts. The correct measurement being taken of the relationship of the jaw in the cranium in each case will prove invaluable for comparison purposes, both of the same case and with cases of other orthodontists. That is valuable, and making gnathostatic casts is really no greater effort than the older way after you get the knack. In fact, by and large you will probably save time, if you get your casts out nicely in your office, by using the gnathostatic method. It shows that not only the teeth but the relationship of the jaws must be improved.

(Slide) Here is the case of a child who was eleven years of age when she came to us. Do you not think it would have been better to do something for this case earlier? Look at the way the maxillary lateral incisors are locked lingually to the mandibular incisors. I brought these cases, as I said before, because I thought I should have to defend early treatment. I could have brought other cases in which nature has done much toward their own

correction. It seems to me about half of them improve, and some correct themselves. I think it would have been much better to do a little something some time ago than to allow this condition to become so aggravated. It seems to me that this patient should have had appliance therapy at six or seven years of age.

(Slide) Casts of a child fourteen years of age. It seems to me that if we let a case go, as some men advocate, we shall not obtain as nice a final result as could have been brought about if it had been taken earlier. I believe it is wrong to leave these cases until this age, or until the children are twelve or thirteen years of age. Such pronouncements are teaching the general practitioner the wrong thing.

(Slide) I saw this boy when I was treating his two sisters some years ago. He is now seventeen years old. Because of change in the family's financial circumstances they felt they could not send this child to an orthodontist. I happened to meet him in quite an unusual way. Their circumstances had not improved, but I said, "You must bring him to my office. We are going to take care of this young man; since we took care of his sisters in better days, it will not cost you anything more than you feel you can spare." Note that the mandibular lateral incisors and cuspids are locked out of alignment, and note the narrowness of the bicuspid regions. Let us look at the maxillary teeth.

(Slide) This again is a case in which the maxillary teeth are much worse than the mandibular teeth. The first bicuspids contact the lateral incisors and the cuspids are completely to the labial. Would you think it good judgment to leave this until the twelfth to fourteenth year before taking care of it? Do you think as nice a result can be produced now as if you had started when the child was younger? Noting the narrow arch and the high palate, I recommended treatment when I saw him at six or seven years of age. His sisters had similar conditions and were treated at that time. It seems to me that there are certainly some cases that would be benefited by early treatment, although I could show a series of cases that were corrected naturally either fully or in large part.

Orthodontic treatment may be classified under seven headings:

1. Physiologic—thorough use in mastication; speech and breathing, etc.
2. Psychologic—as habit breaking, etc.
3. Exercisers—bite strap, odontobel, etc.
4. Myofunctional therapy.
5. Medical—pediatrics, rhinology, etc.
6. Surgical—removal of supernumerary teeth, exposure of impactions, repair of cleft palate and cleft lip.
7. Appliance therapy.

The first is the physiologic, thorough use in mastication, in speech and in proper breathing. We should tell these children that we believe much could be corrected without appliances and that cooperation is essential.

Second, failing in that, the psychologic treatment, as in breaking habits, may be used. Appeal is made to the child's mentality.

Third, exercisers, such as the bite strap, the odontobel, etc., are used. The use of whole-grain cereals, crusty breads, etc., is helpful. If the children do not masticate their food properly, give them an exerciser, and you will be surprised how much many patients are helped. There are, however, many cases in which the exercisers do not correct entirely, and appliance therapy is needed as a supplement.

Fourth, myofunctional therapy. Dr. Rogers has given us that; and it helps. It is based on the sound physiologic principle that applies as well to other parts of the body: "the use of an organ determines its strength," which means its growth also. If that is sound, then myofunctional therapy must be helpful; and experience has proved to me that it is helpful. We see it in the lower animals. We see it in those races of men who masticate a lot, and it must help our patients. If their calcium metabolism has been greatly unbalanced, this may not be sufficiently strong to overcome that, but by and large it stimulates growth.

Then medical assistance, pediatrics and rhinology, the reaction of proper mastication on the growth of the antrum, the curve of the zygomatic arch, the size and form of the nasal chambers, even perhaps of the orbital cavities, are influenced. They are nourished largely

through the same circulatory vessels, and the same nerve trunks react on them; and, if there is good exercise and good function, there will be an effect on contiguous parts as well.

There is also the surgical aspect; that is, the removal of supernumerary teeth, exposure of impactions, repair of cleft palate, and cleft lip.

Finally, after all the others have done their part, appliance therapy must be turned to as a last and final resort.

That is the procedure which I follow in practice, and it seems to be sound.

Dr. Ralph Waldron.—Dr. Porter brought out what was in Dr. Waugh's discussion. While I generally agree with what Dr. Waugh said, pressing the tongue in the mandible as low as you can place it and pushing forward may move teeth, but it is a bad thing to establish bad habits. I think the bite strap or the odontobel is better because you can stop that, but you cannot stop a patient when he has once acquired the habit.

Dr. John V. Mershon.—Is it not true that the confusion in this whole thing is this word "early"? When should cases be treated? I think Dr. Eby has gone into this question in a correct way. He has taken up the periods in which orthodontic procedure should be instituted, and he has also spoken of it as a problem in growth. Furthermore he has taken it up as a thing that should be carried along, not with continuous effort, but in steps as these children develop in growth. I think that is the proper approach to our problem: not whether it is early or late, but what is early treatment.

PROSTHODONTIST TO ORTHODONTIST*

JOHN J. FITZ-GIBBON, F.A.C.D., HOLYOKE, MASS.

CLEFT palate cases showing good orthodontic results are rare. Until a few years ago most orthodontists were reluctant to undertake the treatment of these cases. There were, of course, exceptions, but I believe you will all agree that the average orthodontist of the past, recognizing the complications, had little desire to attempt their correction.

From an orthodontic standpoint, particularly in many of the postoperative cases, diagnosis must include a knowledge of prosthesis. This is of the greatest importance, for in most of these cases a classic orthodontic result cannot be obtained. Missing teeth must be restored, and at times malformed incisors must be brought into position for jackets, bridgework or overlays. For example, a lateral incisor may have to be built up to imitate a central incisor. Six anterior teeth may have to be substituted for a normal four, still maintaining a functional occlusion. There are innumerable complications such as these for the prosthodontist, all evident to the orthodontist as he surveys the case. Good judgment as to compromise must be used. A mutilation is often indicated. The orthodontist, however, together with the prosthodontist, can produce a functional occlusion, good esthetics and a proper vertical dimension. We cannot ask for more in this type of case.

In the correction of congenital cleft palate a definite routine should be followed, as the case indicates: surgery, orthodontia, and prosthodontia. If orthodontia is indicated, treatment should be started at the earliest possible age. If this routine were followed correctly and skillfully, a great majority of these cases would show a much more gratifying result. Numerous men and women who are now failures because of their appearance and speech would be replaced by individuals who could hold their own without handicap in this world.

In this country today, there are some one hundred and fifty thousand individuals with palate deformities for whom orthodontists can be of great service. To render this service, it is imperative that the orthodontists be familiar with the different types of cases and the prosthetic treatment to follow.

As in malocclusion, the different types are classified. The prosthodontist, from a speech correction standpoint, is concerned with four types of congenital cleft palate, together with numerous postsurgical results of each type. We also have the acquired cases resulting from surgery, disease or injury, but in this discussion we are primarily concerned with the congenital cleft palate.

*Read before the New York Society of Orthodontists, New York, N. Y., March 24, 1936.

Type one in this classification is the cleft of the soft palate. This type of case often presents a normal occlusion, but we may find the missing lateral incisor or the impacted tooth (Fig. 1). Type two in our classification is the cleft of the soft and hard palates. The commonest malocclusion is an Angle Class I (Fig. 2). Type three is the cleft of the soft and hard palates, extending forward through the alveolar ridge, with a single harelip (Fig. 3). This

Fig. 1.

Fig. 2.

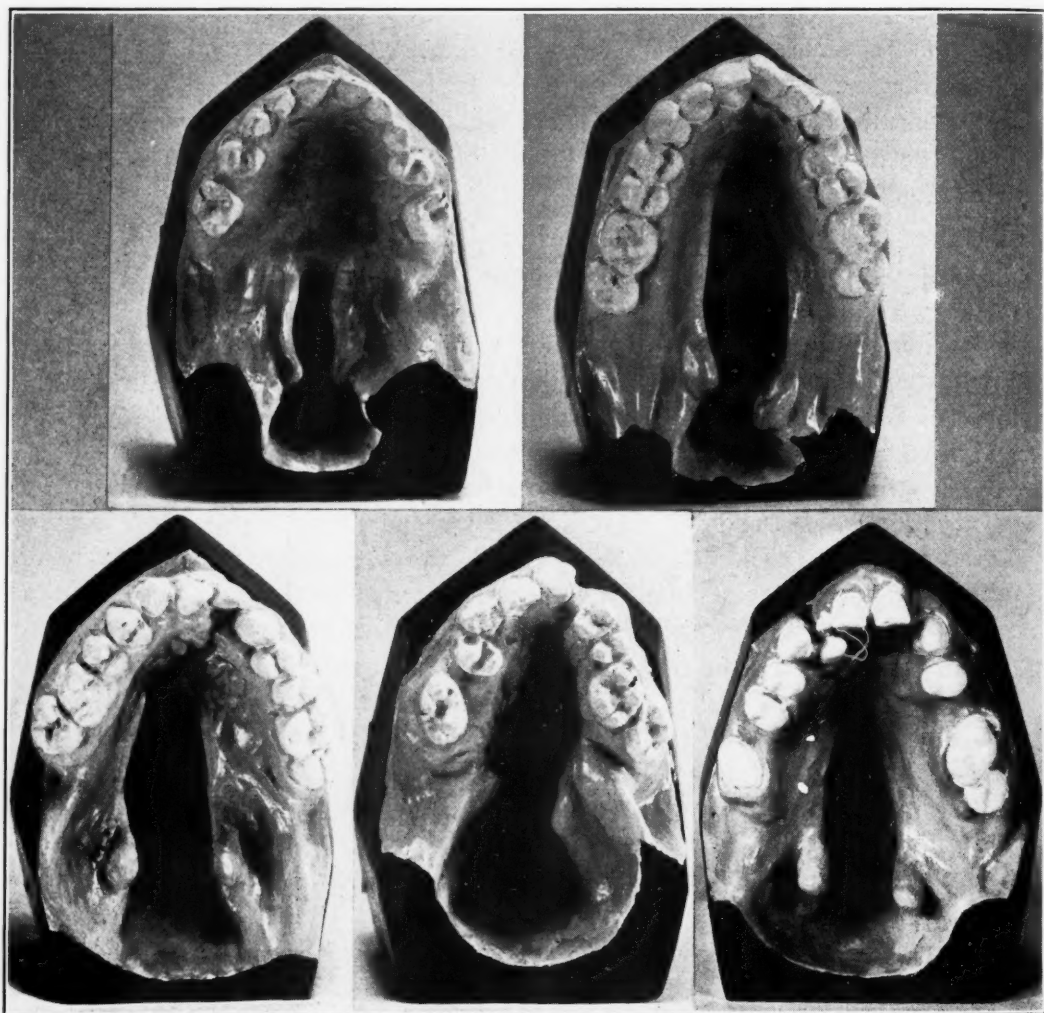


Fig. 3.

Fig. 4.

Fig. 5.

type often presents to the orthodontist a real problem. A tight sphincter results from lip surgery, which in turn influences to a great extent the position of the erupting teeth (Fig. 4). The deciduous arch as well as the permanent arch often shows the deciduous molars or bicuspid on the short side of the cleft in lingual version and the anterior teeth in torsion. In type four, the cleft extends through the soft and hard palates and the ridge at each side of the premaxilla, causing a double harelip (Fig. 5). This type of case often presents an Angle Class III malocclusion, at times with missing

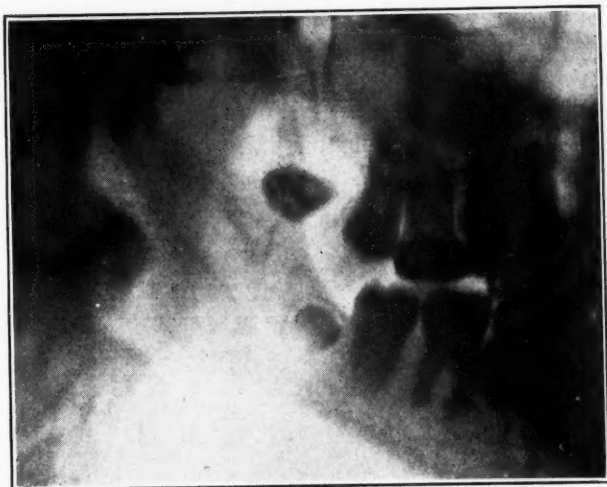


Fig. 6.

Fig. 7.

Fig. 8.

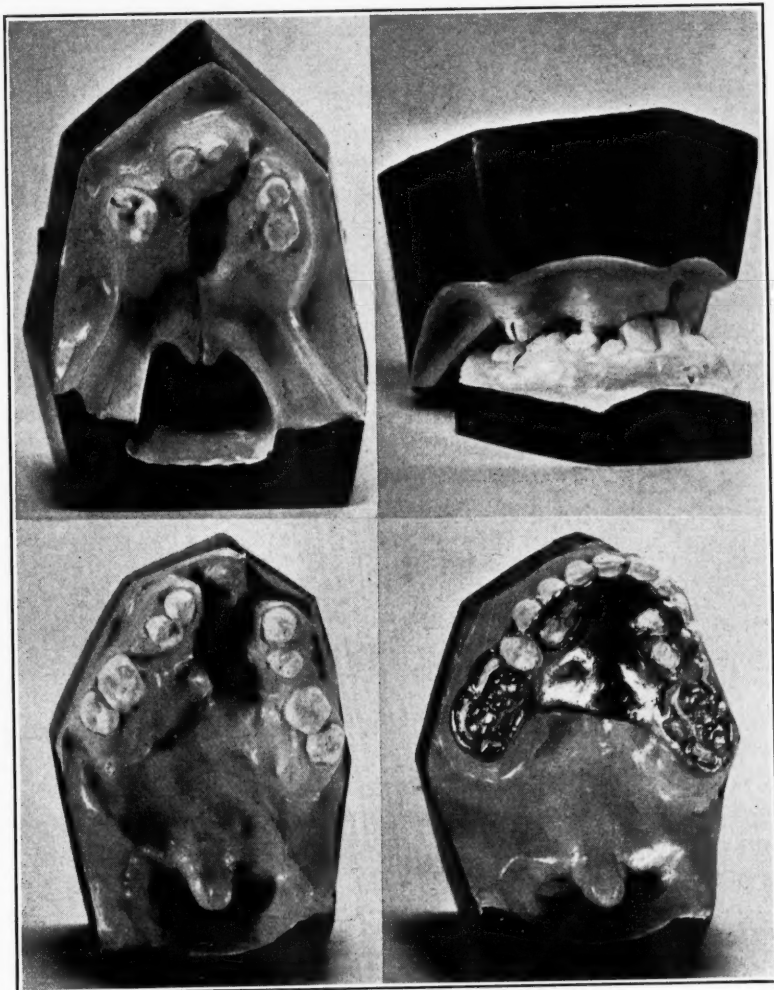


Fig. 9.

Fig. 10.

lateral incisors, and again, with supernumerary teeth in the cleft area. The premaxillary process is detached and mobile. A case such as this requires a careful study and survey. At times a fixation of central and lateral incisors, if they are present, may be obtained after orthodontic treatment by attachment to the cuspids. Again, surgery may follow orthodontia and these incisors may be sacrificed. By bringing these teeth into normal occlusion, however, we have influenced maxillary development.

Fig. 11.

Fig. 12.

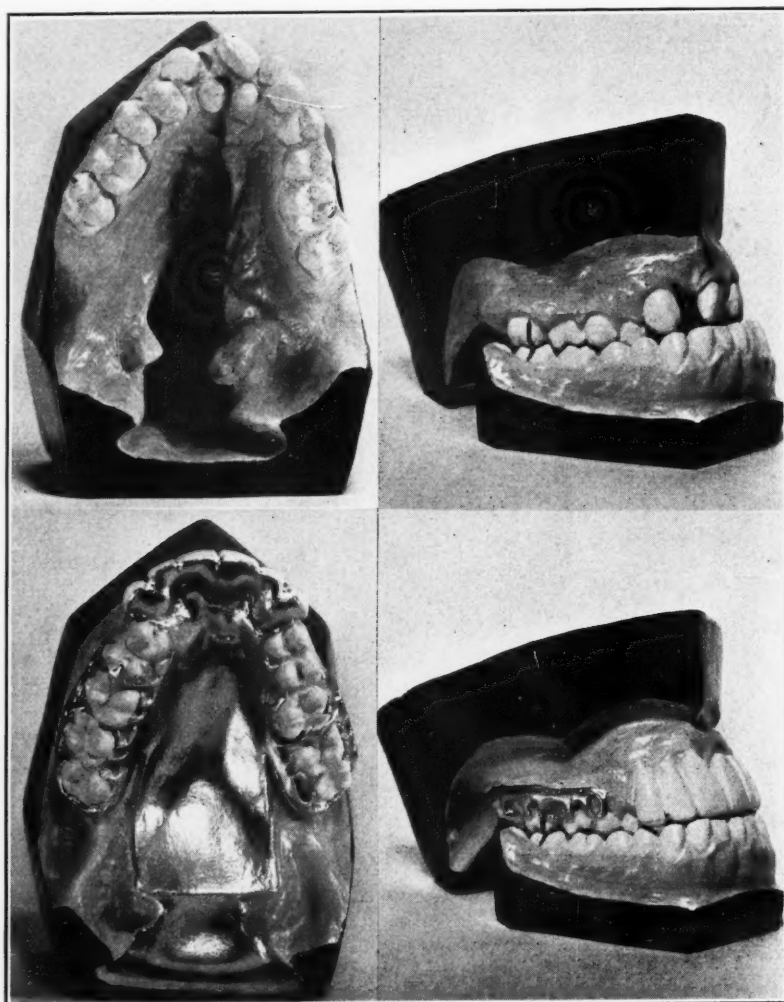


Fig. 13.

Fig. 14.

In the postsurgical cases, we have every possible class and division of malocclusion to contend with. An x-ray check for all missing or unerupted teeth is essential. Second or third molars may be found behind the soft palate—for example, Fig. 6, malposition of a third molar. In types three and four postsurgical results, we have the missing tooth problem. Tooth buds may have been destroyed. The premaxilla may have been excised in whole or in part. In this type of case orthodontic treatment is always indicated,

for example, Fig. 7. At five years of age, this boy had an extreme Class III malocclusion. The entire maxillary arch was in lingual occlusion, and the deciduous mandibular incisors were approximately 10 mm. mesial to normal. Of course in this type of case the orthodontist must consider the restorative work to be done. The maxillary arch must be expanded and an effort made

Fig. 15.

Fig. 16.

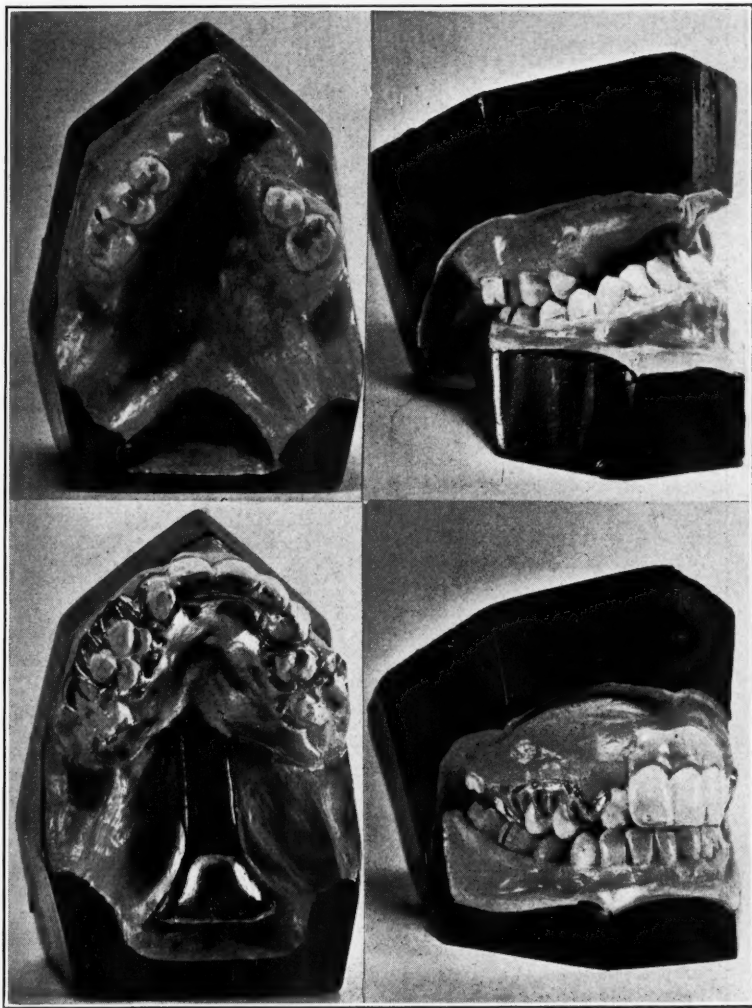


Fig. 17.

Fig. 18.

to retard mandibular development. The so-called chin retractor may be employed for this purpose. Its use will at least influence the eruption of the permanent mandibular anterior teeth. Fig. 8 shows the result of this type of treatment. Mandibular mutilation must also be considered—the extraction of the lateral incisors or the first bicuspid. In this case, the first bicuspid are to be removed in the very near future. Where this type of mutilation is necessary, the unerupted teeth should be removed as early as possible—certainly before the tooth is fully developed.

The numerous types of postoperative results in which orthodontic treatment has not been attempted, tax the prosthodontist to the n'th degree in occlusal problems. For example, Fig. 9 shows a type four postoperative result with the premaxillary process cut down to a minimum, the few remaining teeth in lingual version, and the vertical dimension 6 mm. short. In this type of

Fig. 19.

Fig. 20.

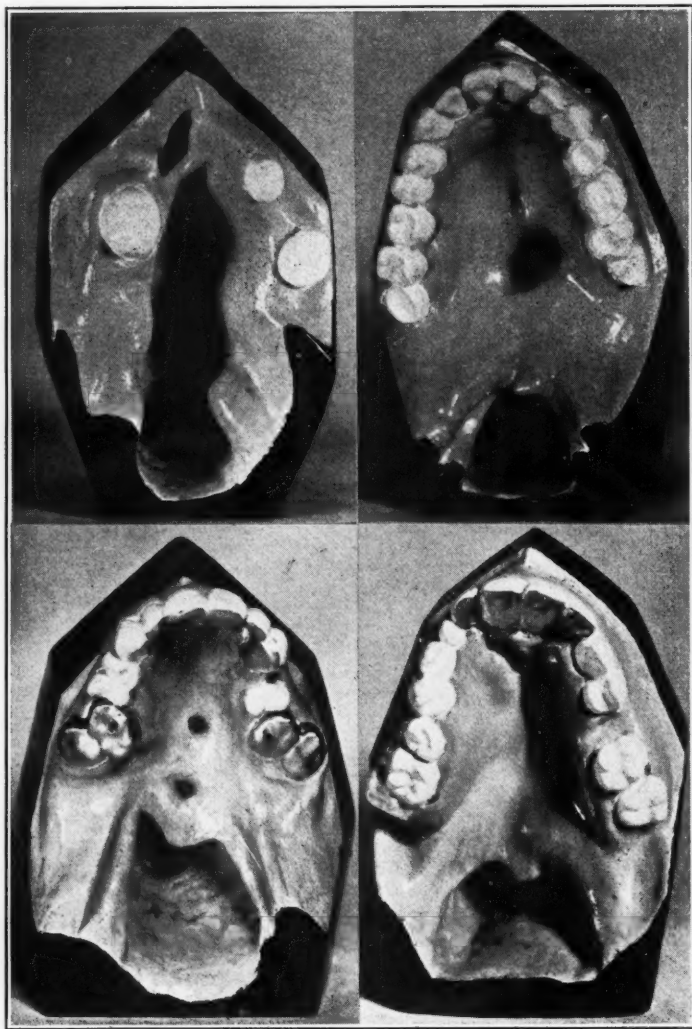


Fig. 21.

Fig. 22.

case, a duplex casting is made (Fig. 10), stabilizing the premaxillary process and restoring a normal palatal vault. The bite is opened with onlays of the appliance. The occlusion is restored with overlays on the remaining cuspids and bicuspids. The lip contour is restored by the anterior plumping of the appliance.

We also have the adult case with a malocclusion, or a postorthodontic result, necessitating fixed bridgework with off-set facings and, at times, porcelain blocks for plumpers. Fig. 11 shows a type three case. The right

central incisor is missing, and the lateral incisor and a supernumerary tooth are in the cleft area. The occlusion is shown in Fig. 12. The teeth in the cleft area, together with the left lateral incisor, are removed. The cuspids and left central incisor are prepared for thimble castings and a six-tooth off-set bridge is built on these three abutments, restoring lip contour. Fig. 13 shows the finished case with speech appliance in position and Fig. 14, the occlusion.

A not uncommon surgical mutilation is shown in Fig. 15, with an occlusion as in Fig. 16. This is the type of case that can be nicely handled with a fixed anterior bridge with porcelain block. Fig. 17 shows the palatal view of this case with the anterior fixed bridge and palate appliance in position.

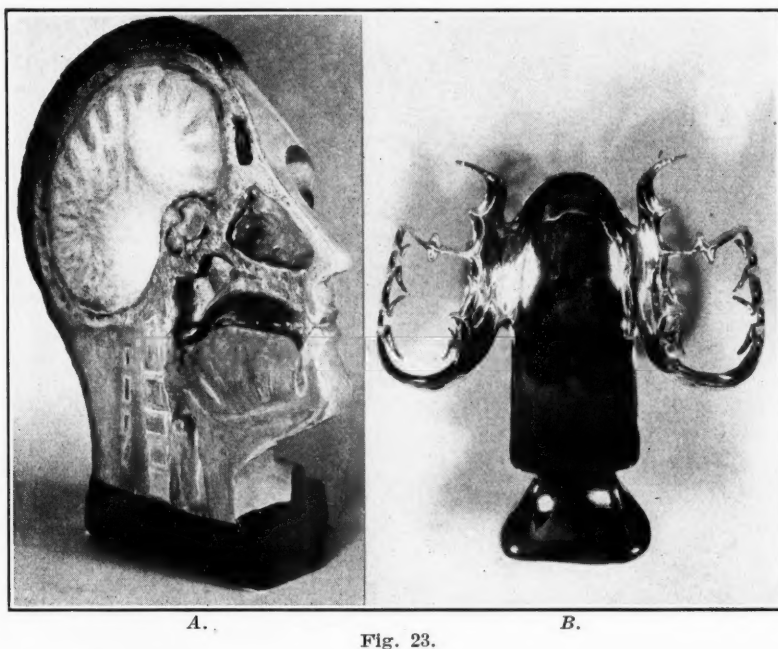


Fig. 23.

Fig. 18 is the occlusal view. Note the porcelain block for lip contour. In this case the mandibular anterior teeth have been retracted, the first bicuspid having been extracted to facilitate this.

Time does not permit dwelling too long upon this one phase of palate correction. The need of the orthodontist is established. Although functional occlusion and esthetics are necessary, good speech is of paramount importance. As previously stated, surgery plays an important part. A surgical closure of the cleft is an ideal first step, although we must realize that in a great majority of these cases a perfect union of the parts does not restore or create normal speech. Even in the classic surgical results, there is still a velar insufficiency, and cleft palate nasality persists. Then, of course, there are the numerous surgical failures as, for example, Fig. 19, a complete failure of a type three cleft; Fig. 20, a type two postoperative result with a median perforation; Fig. 21, a postoperative Brophy result with perforations, showing the typical constricted maxillary arch; Fig. 22, a type four classic surgical result, though

the patient still has a velar insufficiency. However, the speech correction of all cleft palate cases, postsurgical or in which there has been no surgical intervention, can be accomplished by employing a definite technic based upon a definite principle.

You are all familiar with the function of the normal soft palate in the production of articulate speech. It levitates and constricts, at times blocking

Fig. 24.

Fig. 25.

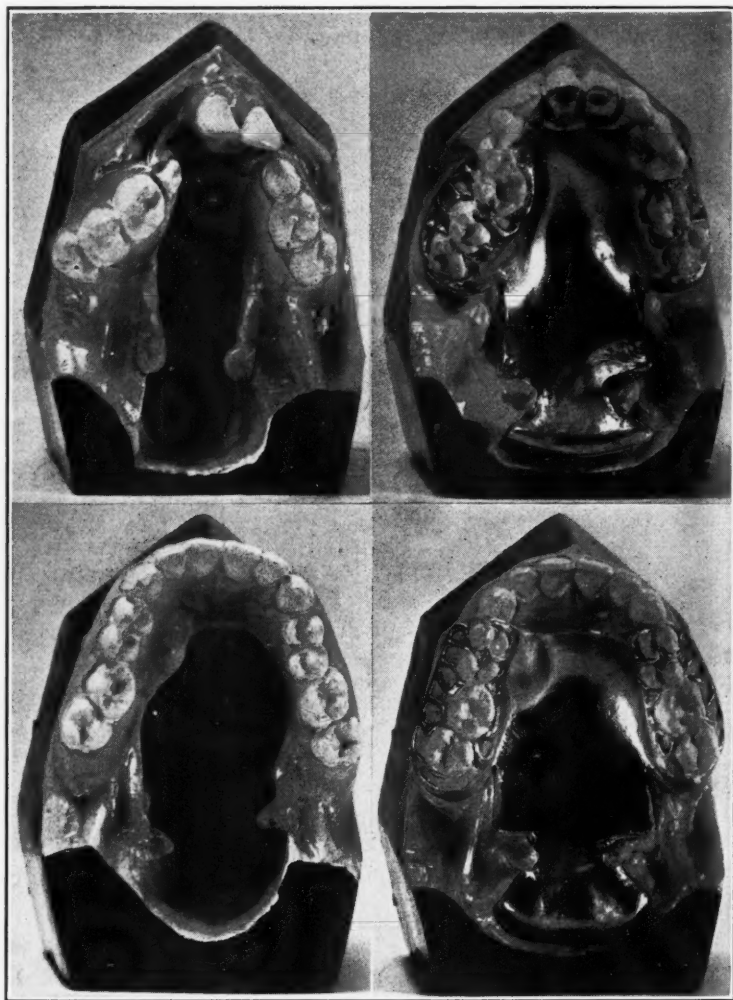


Fig. 26.

Fig. 27.

off the oral cavity from the nasopharynx and again allowing certain tones to pass behind and through the resonant cavities of the head. With the cleft palate victim there is no palatal control of tone, hence the typical nasality of cleft palate speech. Therefore, not only must we restore the soft and hard palates by surgical or mechanical means, but we must also substitute that which will simulate, in the production of palatal consonants, the tone produced with the normal palate function (Fig. 23A). This is accomplished by placing a hollow bulb, properly shaped, in a definite position in the pharyngopalatine

arch. This arch, when constricted, grips the bulb, producing the result of the levitation and constriction of the normal soft palate. The construction of this palate appliance is probably of no particular interest to orthodontists, but a description and application of it, together with the principle of its manipulation, should be.

The ideal appliance is of all metal, preferably of cast gold. It can be kept clean, and we are assured of excellent tissue tolerance (Fig. 23*B*). A

Fig. 28.

Fig. 29.

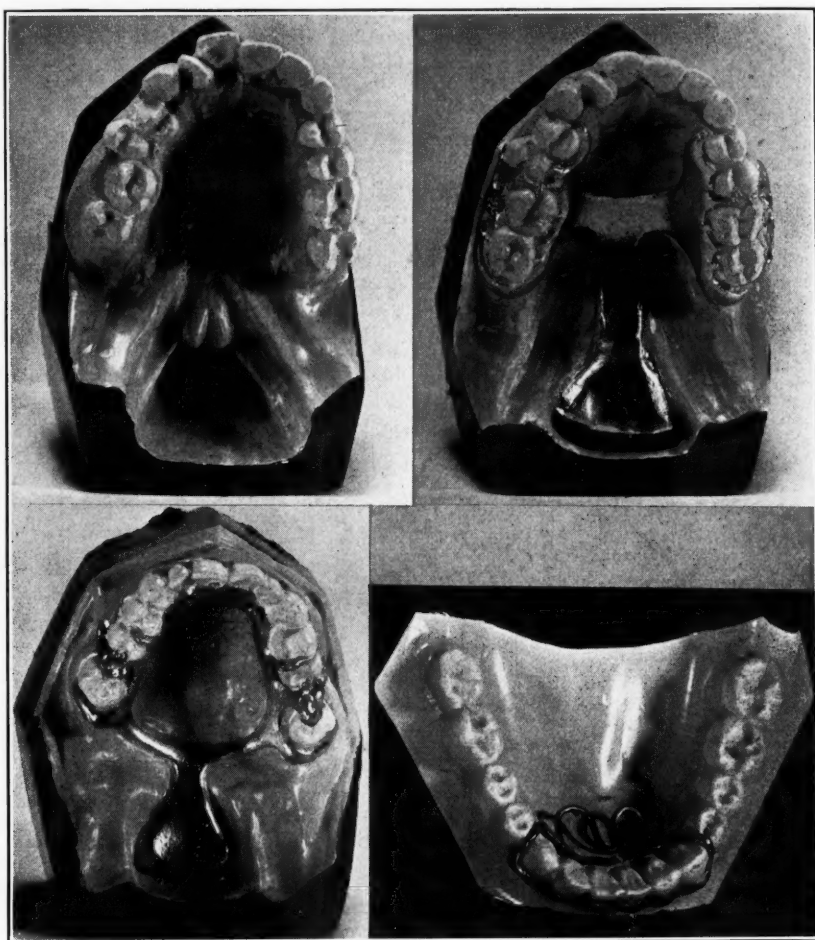


Fig. 30.

Fig. 31.

few illustrations will give a fair conception of the application and design of this appliance. Fig. 24 presents a type four case calling for an extremely large appliance, and Fig. 25, this appliance in position (note that the central incisors are built up with off-set facings to restore occlusion). Fig. 26 is a type two surgical failure with great loss of structure; Fig. 27 shows the restoration. Fig. 28 is a type two fair surgical result with perforation, necessitating a much smaller and lighter appliance because of the fact that surgery has been fairly successful. Fig. 29 shows the appliance necessary for this type of case. Fig. 30 shows a light skeleton plate carrying the bulb for the

correction of a velar insufficiency in a postoperative type two case. (Note the lack of palatal coverage, due to successful surgery.)

Of course a properly designed and constructed appliance is not the miraculous overnight speech corrective device that most people, with little knowledge of the speech mechanism, believe it to be. It is the means of good speech, and the patient with the ability to learn and the will to do can accomplish remarkable things with it. The first lesson for them to learn is the gripping of the bulb. From early childhood, the cleft palate victim, in an endeavor to mimic normal speech, acquires faulty tongue habits. A particularly vicious one is raising the dorsum in an effort to block the cleft. This leads to the habit of keeping the tip of the tongue in a more or less immobile position behind the mandibular incisors. The earlier these habits are corrected, which is one of our most difficult problems, the easier it is for the patient, as well as the instructor. Here again is an opportunity for the orthodontist to assist by early diagnosis of these faulty habits and by designing the regulating appliances so that they will tend to serve as corrective tongue placement appliances as well. In speech instruction, I often use supplementary appliances for tongue placement. These appliances are removable and are used only in speech practice. A diagnosis is made of the outstanding tongue habit, and an appliance is designed to correct it. Fig. 31 illustrates the one most often used. It consists of a crib fitting over the anterior teeth, supporting a lingual inclined plane which prevents the tip of the tongue from being placed incorrectly. It is evident that the plane can be adjusted to influence the tip of the tongue upward. With cooperative patients, this technic has been of great help.

If we will all assume the responsibility of our respective work in the correction of cleft palate cases, much can be accomplished toward the comfort and happiness of these most unfortunate crippled persons.

DISCUSSION

Dr. Abraham Lees.—I should like to ask Dr. Fitz-Gibbon, as well as the men who may follow me, about the problem of lues, that may be involved in these cases, whether he has had any experience in treating such cases, what the influence of lues has on the orthodontic correction of these cases, and what dangers there may be of luetic infection to the operator.

Dr. Fitz-Gibbon.—Are you talking of the acquired luetic cases of cleft palate or the congenital cleft palate cases that may be luetic?

Dr. Lees.—Both; either or both.

Dr. Fitz-Gibbon.—I know very little about the luetic orthodontic patient. The acquired cases in palate prosthesis that we see, in which there is a perforation, for example, are always adult cases. The youngest patient I have ever seen with a tertiary lesion in the mouth was a boy of eighteen years. I have made routine checks on congenital cleft palate victims, and I find negative reactions just about as with other patients. In other words, I do not consider lues an etiologic factor of cleft palate or congenital cleft palate.

Dr. Lees.—Is it more difficult to treat a case of that type by orthodontic appliances than it would be if lues were not involved?

Dr. Fitz-Gibbon.—If you are asking me what to do, I would immediately see to it that the patient had antiluetic treatment, and continue with the orthodontic treatment just as for

any other case, of course; and I am very sure that there would be no difficulty. We often insert cumbersome appliances directly into a lesion, and, if they are properly controlled, there is perfect tissue tolerance of the appliance.

Dr. Riesner.—I should like to ask: In the light of your experience, what is the prognosis for lateral stimulation as in the case of Class IV type which you demonstrated—the lateral stimulation for some of these segments—is it favorable?

Dr. Fitz-Gibbon.—You want my opinion of the result of lateral stimulation?

Dr. Riesner.—Is it feasible? Should we attempt it?

Dr. Fitz-Gibbon.—Yes, by all means.

Dr. Riesner.—Is there favorable bone reaction? Will we create a greater cleft?

Dr. Fitz-Gibbon.—If you do, it does not matter. That is a very good point, because that is one of the reasons why so many men are reluctant to attempt orthodontic treatment for a postoperative result. Where there is median perforation, they are very much afraid they may open up the median suture and get in trouble, but disregard that entirely. Do your work.

Dr. Henry Sage Dunning.—I have been very much interested in trying to correlate the three branches of the healing art in these cases: prosthodontia, orthodontia, and surgery. Dr. Waugh and I have been trying for some time to get a big jaw clinic started at Columbia, where we can take care of these unfortunate people. Orthodontia is so very important in the treatment of these patients that it is pitiful more of it is not done. I think we have more orthodontists than oral surgeons, and these people are not getting treatments. We cannot obtain good results without prosthodontia and orthodontia (I should say orthodontia first because the orthodontia should come very early; it should come with surgery).

Dr. Fitz-Gibbon puts surgery first, and I think in most cases surgery does come first, earliest, but it is a mistake to operate too early on these palates. At three, four, or five years is better, as a rule, than at eighteen months as was previously done. The structures do not break down so much, and the child is alive at the end. The patient stands the operation very much better. The material is thicker, and does not break down. Most of the postoperative cases have broken because the operation was done too early. If the child is in excellent condition I feel, with Dr. Blair and some of the Western people, that we ought to obtain 90 per cent surgical closure on the first operation. They are not worth anything unless we obtain the proper occlusion and the arch is corrected; and then many cases need prosthodontia. For a posterior cleft, supplementing a short palate, that is necessary. We do not always obtain a good functional closure result on a surgical closure, and many times we do have to have a prosthetic appliance to help out unless we use this very drastic operation, which sometimes breaks down, the push-back operation that Dr. Fitz-Gibbon has been talking about; and it is only in rare cases that the Brophy operation should be used.

I feel that it is very important that the treatment should go along with surgery, and in that way in many cases we could get the individual back to normal, who would otherwise be a social outcast. There are so many cases that we cannot do anything with, in which the patients need very carefully constructed prosthodontic appliances and in which, as Dr. Fitz-Gibbon said, the lip is very tight and has molded the anterior part of the arch, the teeth are in very bad alignment, and the arch is constricted (perhaps due to the Brophy operation and perhaps not due to the Brophy operation, but I do think loss of teeth and contracted arch form may be due to this, but the Brophy operation is not being used now). The only operation being done now is to close the anterior cleft with one single operation after the Moore-head method; but, even so, we need a great deal of orthodontic work done early with these patients, starting at three, or four, or five years, and going on until sixteen and longer. If we could possibly work out some way to accomplish this, it would fill a great need.

I am eager to see whether in the near future we cannot have a symposium in which surgery, surgical treatment, prosthodontia, and orthodontia could be brought together a little better, a little closer, to determine whether we cannot have centers in different parts of

the country for these unfortunate people. There are so many of these cases at Columbia Dental School that we are not doing anything for because it costs money. It is an expensive game in surgery, and it is expensive in the orthodontic end, of course, and also very expensive from the prosthetic standpoint. I think we ought to have an endowment for this work, and it would be a marvelous thing if some society or school took it up because in all towns there are these problems. Many times on account of lack of orthodontic treatment a great many teeth have to be sacrificed.

Dr. Fitz-Gibbon's picture was very clear where he emphasized stabilizing the premaxillary bone. The premaxillary bone, if it is not united in the first operation, generally is loose and is a great source of inconvenience to the surgeon and to the patient. The stabilization that he did was a very excellent plan; that is, having some appliance on the central incisors and then going back and stabilizing the premaxillary bone. So many times that premaxillary bone has been removed in the past, and then there is a large opening in the nose, which is a very bad arrangement indeed and is nothing short of criminal in some cases in which the premaxillary bone has been cut out by surgeons and thrown away.

The saving of the teeth is most important, and it is a very serious thing from all standpoints if all the teeth are taken out. Dr. Fitz-Gibbon mentioned that boy who came to him with but three teeth saved. That is important, and many times when all the teeth are missing from a very faulty arch, resulting from decay and neglect, it is almost necessary to make epithelial inlays way up around the arches in order to get flanges high enough to retain a prosthetic appliance. I have seen several in which all teeth have been removed in a very contracted arch, and it is almost impossible to make any kind of prosthetic appliance; surgery has failed and the person is absolutely up against it. I should like to make a plea for early orthodontia and also for prosthetic work, and the care and hygiene of these poor people. We very often see coming into our offices a nice girl nineteen or twenty years of age with contracted lips, the very full mandible, the lower lip that is one-third or two-thirds larger than the upper lip. Sometimes we turn up a piece so (indicating) in the upper lip and make it a fuller lip, but these patients are social outcasts. I feel that, if we could all take more interest in them and preserve the tissues and work together to get them into normal shape, it would be a tremendous help and would be a step in the right direction.

I never heard of the method that Dr. Fitz-Gibbon spoke of: trying to prevent the development of the mandible. Of course, the maxilla has been very much retarded by these wiring operations and also by the surgical operations; however, it is new to me that you can retard the development of the mandible, and I think that is a very interesting and ingenious type of work. I should like to know whether that could be done to any extent to overcome some of the great discrepancies between the lack of development of the maxilla and the abnormal development of the mandible.

Dr. Fitz-Gibbon.—From observation, we apparently do, or at least influence the eruption of the mandibular teeth. I think that is a problem for the orthodontist to answer.

Dr. Perkins.—This form of orthodontia for cleft palate children has been of great interest to me, and for the past ten years I have been doing a great deal of it. I hope that what Drs. Fitz-Gibbon and Dunning have said will encourage more of you to undertake some of these cases and do all that you can for them. Two of us in Boston are handling about fifty cases between us, and from that work I have found the most gratifying and about the most satisfactory work that I am trying to do in orthodontia. The evidence is accumulating that if the patients are taken earlier, four, five, six, and seven years of age, and guided all through their development, at twelve, fourteen, fifteen years of age we do not have these horrible, impossible conditions that are commonly seen at that age if they are not treated at all. I hope more of you will undertake it and get the satisfaction from the work that both of us in Boston are getting in our effort.

Dr. Joseph D. Eby.—My experience in this kind of work began almost in boyhood when I used to help Dr. Hynman with his operations. I have seen Dr. Brophy do innumerable operations, assisted by Dr. Chalmers Lyons, and some of our most able men. I have not been in very close contact with the coterie here in New York who do the surgical end of the work except in an orthodontic or a prosthodontic association.

There are some fundamental principles involved that can be used to simplify almost any case from a mental standpoint. Many oral surgeons, or surgeons who embrace the licensed operator, many orthodontists, and many prosthodontists attempt to treat cleft palate conditions and because of their own limitations fall short of their mark because they sometimes try to make the task too difficult. My observation has been that we obtain the greatest success only in young adulthood, as Dr. Dunning said, to prevent these patients from becoming veritable social outcasts. You may follow children until they are in their late teens, eighteen or nineteen years old, and at this stage a blithe young girl who has been carrying her handicap splendidly will soon learn that she is going to be limited; a metamorphosis will often take place, and she will develop into a morbid person. To my mind there is no greater thrill than preventing that condition, and giving them what we might call a maximum degree of improvement.

There is nothing that calls for a more intimate or closer relationship than treating these cases from the three services. Close cooperation is needed among the oral surgeon, the orthodontist (if he should come next) and the prosthodontist. Many cases, in fact the majority of them, fail because of that lack of perfect relationship. Too often the orthodontist will tackle the task not knowing where he is headed, or the oral surgeon may begin the task and not consult an orthodontist and ignore that phase of the problem entirely. It has been my experience and observation—and I should like to leave the thought—that the very earliest age a child can be put in the hands of the orthodontist will ultimately lead to the best maximum result. I have never hesitated to expand in the presence of the deciduous dentition to any degree, I do not care what it was, laterally in the maxillary arch, and particularly in Dr. Fitz-Gibbon's very lucid classification of Class III and IV cases, to pay absolutely no attention to the palatal aspect of the thing, whether it has been operated on or not. You should do everything you can to establish a definite, direct functional relationship between the maxillary and the mandibular teeth, so that the forces of occlusion and the muscles would be more nearly normal. Certainly the opportunity for the stimuli for that face to develop downward and forward will be put at its maximum at the earliest possible age or stage, and at that age and stage I believe that these extreme cases of lack of vertical growth, to which Dr. Fitz-Gibbon referred, or the lack of downward and forward growth in the superior maxilla, can be to a very large degree circumvented. In the earlier stages it is thoroughly appropriate and absolutely within the bounds of reason to insert a mandibular labial arch, which in itself may have a retarding influence, and even that may be augmented by Class III intermaxillary elastics, and assist the prevention of retarded vertical growth of the superior maxilla.

In types three and four, as Dr. Fitz-Gibbon classified them so simply and so beautifully, he is doing everything in his power to make a difficult task simple.

As far as expansion is concerned, Dr. Riesner, I would not hesitate to expand a maxillary arch three-quarters of an inch if it were necessary to obtain occlusion of the maxillary and mandibular posterior teeth.

Instead of getting an alveolar transposition of the teeth, relieved of any resistance which the palatal process offers, it has always struck me that the tissue changes in the hard processes would be out in the labial plate and the outlying and labial and buccal area of the superior maxilla, which is doing what you want. If you have one trouble inside, if you have to make that trouble a little worse, it is better to do that than to make two troubles for yourself; and so functional relationship, at all costs, has been my idea of the orthodontic approach.

I have found that the ultimate success of a case, the best preparation that you could make for it, to place it in the hands of the prosthodontist, is the removal of any questionable maxillary anterior teeth if they are faulty in development, malformed, soft, or if they are below the occlusal plane. Where they are up in the zone of the fissure, to endeavor to conserve those teeth means to make such a sacrifice in the esthetic effect.

It has also been my personal observation that in the acquired clefts from disease or injuries, where those people have previously been able to speak, it is relatively easy to restore

enunciation of almost perfect speech to them. So often the lack of coordination of the three departments, plus general dentistry—because as Dr. Dunning said, if you do not preserve the teeth that are almost as precious as diamonds, there is going to result a condition for which all the oral surgeons, all the prosthodontists and all the orthodontists in the world cannot do any good, so we should not omit the general dentist as one leg of a four-legged table rather than one leg of a tripod—is responsible for the distressing conditions we so often see. We should all coordinate in our respective ways, intelligently and with cooperation, the surgeon realizing that he is not doing it all, the orthodontist realizing he is not doing it all, and the prosthodontist realizing he is not doing it all. Then comes that final chapter of the book to be written so often, the great problem of speech. Even orthodontists or prosthodontists are not in a position to write the end of the book; that is, to give these people speech.

Dr. Abraham Lees.—I should like to ask Dr. Fitz-Gibbon how he would correct a lingual lisp.

Dr. Fitz-Gibbon.—As to speech correction, there are several types of lisps; that is, the lateral lisp, the infantile lisp, and so on. My personal observation is that these impediments are due to faulty tongue placement, and I believe that the aid of a mechanical device is very valuable. The results show that where we employ this type of treatment the cases are much more readily aided by speech correction than they are without it.

TREATMENT OF EXTREME UNILATERAL BUCCAL DISPLACEMENT OF MAXILLARY TEETH*

EDWARD I. SILVER, D.M.D., BOSTON, MASS.

HISTORY.—Male, aged seventeen years and seven months, weight 145 pounds, height 73 inches. Apparently no hereditary characteristics. Tonsils and adenoids removed at age of five years. Early childhood diseases, measles and chickenpox. Check-up on general health of patient for question of hyperpituitary proved negative from a metabolism test made by family physician.

Etiology.—I believe the very important influencing factor in this case was the resting of the chin and side of the face on the left hand while the boy studied; also the patient recalls constant cheek biting and sucking on the left side between the teeth.

Fig. 1.

Fig. 2.

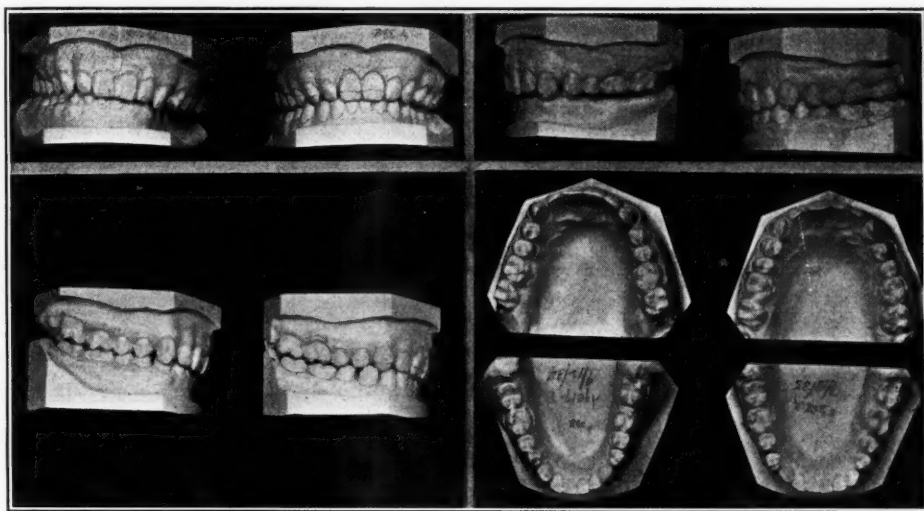


Fig. 3.

Fig. 4.

Diagnosis.—X-ray findings were negative. The study of symmetry of the arches of this case with the aid of a Hawley chart indicated that the maxillary left side was overdeveloped as a result of the buccal displacement of the first and second premolars, and the first and second molars, and a mandibular lingual collapse of the left side. I believe this case to be Angle's, Class II, Div. 2.

Treatment.—The following procedure for the plan of treatment was instituted:

1. Opening of the bite on the posterior teeth by an inclined plane on the anterior teeth from canine to canine (to permit movement of the posterior teeth without any points of interference).

*Read before the New York Society of Orthodontists, New York, N. Y., March 24, 1936, and presented to the American Board of Orthodontia, April 30, 1936.

2. Buccal movement of the teeth of the mandibular left side individually.
3. Lingual movement of the teeth of the maxillary left side individually.
4. Once occlusion is established, interference of the maxillary anterior teeth be removed by labial movement, and also correction of distoclusion.

This case was started by cementing a soldered inclined plane from maxillary canine to canine. For anchorage, on the maxillary arch, in order to move the left side lingually without disturbing the right side, a sectional pin and tube was made extending from the maxillary right first molar to the left canine.

At the same time, on the lingual, a lingual arch wire was placed with a vertical half round tube on the maxillary right first molar and a horizontal round tube on the maxillary left first molar to tip the maxillary left first molar lingually.

On the mandibular arch the first molars were banded, and a lingual arch wire was placed with a vertical half round tube on the lingual of the right molar and a horizontal round tube on the lingual of the left molar, pitting the force against the left first molar.

Appliances were set October 13, 1934. First molar relationship was established February, 1935 (four months later), at which time the next step for bringing the second molars into position was carried out.

This was accomplished by continuing the pin and tube appliance on the maxillary arch, so as to include the maxillary left first molar and to hold the arch alignment in that position. The lingual arch wire was then removed; a lingual sectional wire was made from the first molar to a round horizontal tube on the second molar for the lingual movement of that tooth. Similarly, on the mandibular arch a sectional arch wire was made buccally, for the buccal movement of the second molar. It seemed that with the removal of the slight interference of the maxillary central incisors by very little labial movement, the rest of the arch settled into good relationship with the mandibular arch.

In July, 1935, the teeth on the left side, with the exception of the third molars, were all in occlusion. The soldered inclined plane has been off since September 3, 1935, and a Hawley removable vulcanite with an inclined plane was made to be worn as a retainer.

Result.—The progress models as of September, 1935, show a normal overbite as compared with the original models of September, 1934 (Fig. 1), and an excellent anteroposterior relationship (Figs. 2 and 3), and all the teeth in occlusion except the maxillary left third molar. The mandibular left third molar is still unerupted. The occlusal view for comparison is shown in Fig. 4.

This patient has been instructed to carry out the masseter-temporal exercises since we reached a mechanical advantage, and he has been very cooperative. Time will prove the ultimate result of this case, but I believe the outlook to be favorable.

THE SOLDERLESS BAND

MORRIS R. LEBOW, D.D.S., PROVIDENCE, R. I.

THE solderless band was created to simplify procedures in band construction. The orthodontic band of today is made from a strip of plain band material, from the ready-made seamless band, or from the Angle anchor band.

The band made from a plain strip requires an exacting technic and takes up valuable time; the seamless band requires a sufficient stock on hand and with it a considerable amount of laboratory procedures; the Angle anchor band has the objectionable screw and can be used only for molars.

The solderless band, on the other hand, has the advantage of a simplified technic. A well-fitted band can be made within three to ten minutes. There is no need to carry a stock of assorted sizes on hand, because one band can be made to fit all teeth, molars, premolars, and incisors. It also has other important advantages.

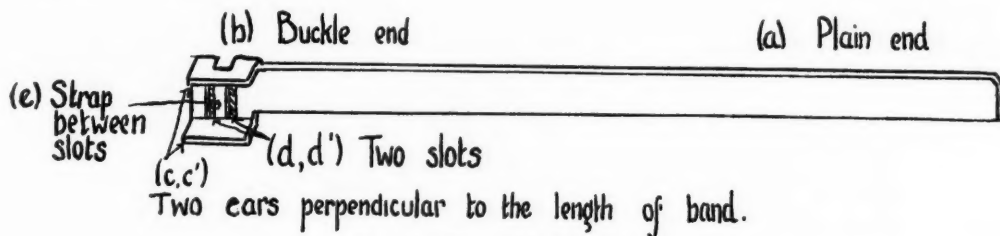


Fig. 1.—The solderless band.

First, no soldering is required to make a fast joint. It is jointed by simple mechanical means.

Second, a buccal tube can be formed from the same strip of material after the band is made, which is an integral part of the band. This lends itself for the use of chrome alloy, as well as precious metals. The steps are identical except when one uses precious metals. One may, if one desires, solder the joint, the seam of the buccal tube, and other attachments; whereas in chrome alloy no soldering is required. All other attachments, such as the half round tube or the intermaxillary hook, are crimped onto the band mechanically, as will be illustrated.

Fig. 1 shows the solderless band. The points of interest to be observed are:

- (a) the plain end
- (b) the buccal end
- (c, c') two ears perpendicular to the flat surface of the band
- (d, d') two slots
- (e) a raised strap between the slots.

Clinic presented before the New York Society of Orthodontists, Nov. 19, 1935.

To form a band the plain end (*a*) (Fig. 1), is passed through the two slots (*d, d'*) under the raised strap (*e*) as shown in Fig. 2. This band can now be pulled up very much like a belt.

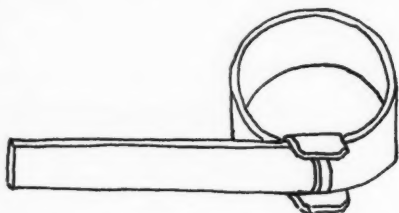


Fig. 2.—Band ready to be inserted into band tightener.

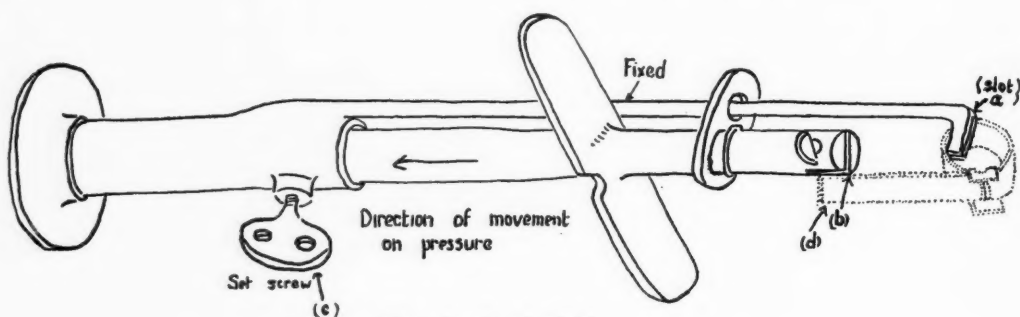


Fig. 3.—Band tightener.

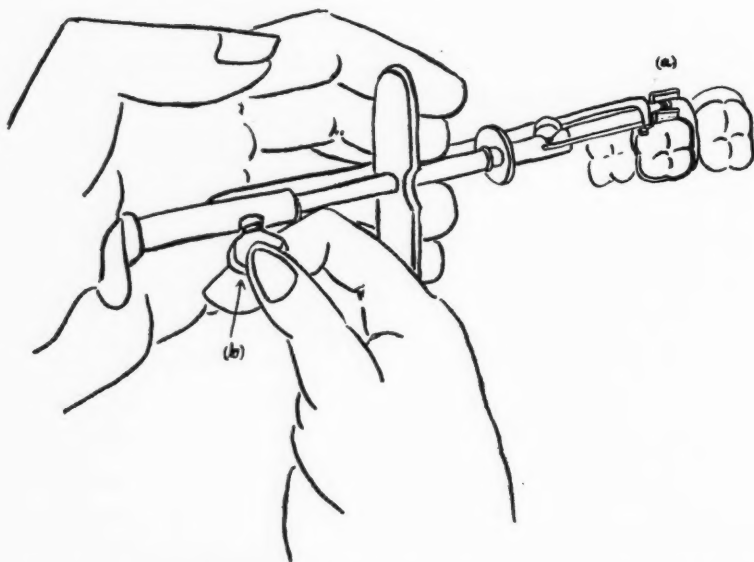


Fig. 4.—(*a*) Band tightened around tooth; (*b*) screw set after tightening.

A special tightening instrument (Fig. 3) is used to pull the band firmly around the tooth. A short description of the instrument at this time is essential. Built like a hypodermic syringe, but instead of pushing the plunger with pressure it pulls it backward away from the object. Thus, the end (*d*) of the band (Fig. 3) is clamped into the end of the instrument (*b*) and between the slot (*a*). Pressure exerted will pull the band tight around the tooth as shown

in Fig. 4a. After the band is tightened on the tooth, a set screw (b) on the instrument (Fig. 4) is now fastened. This locks the instrument and prevents the band from opening.

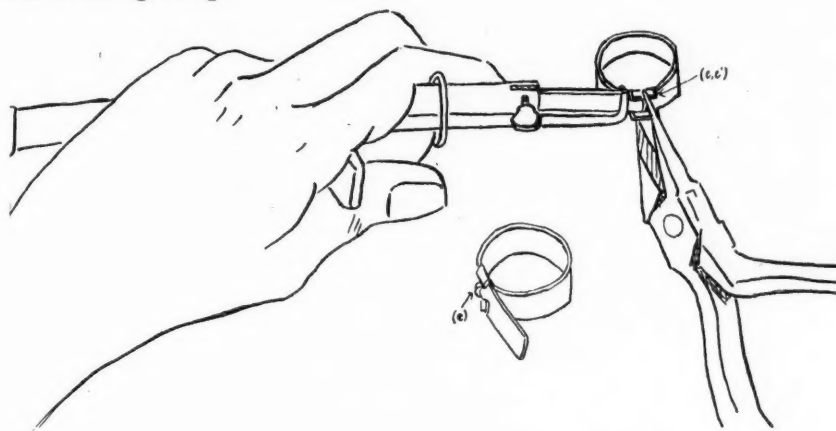


Fig. 5.—(c, c') Crimping or jointing band; (e) loop formed after crimping.

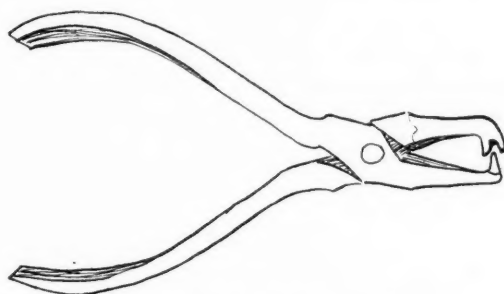


Fig. 6.—Tube forming pliers.

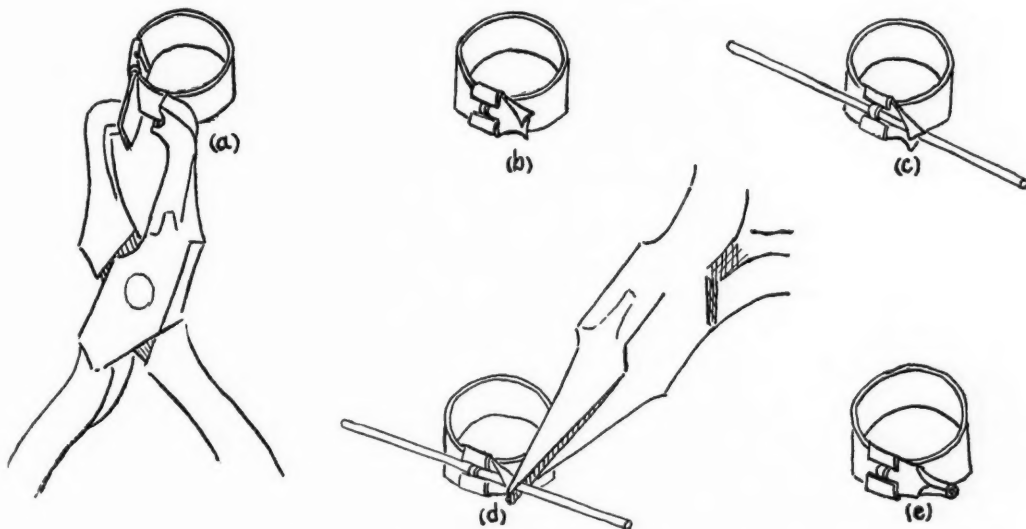


Fig. 7.—Steps necessary to form buccal tube.

The instrument and the band are now removed as a unit, and the band is locked or mechanically jointed by crimping together the two ears (c, c') as shown

in Fig. 5. The locked band can now be removed from the instrument. It must be here noted that when the two ears are crimped together the raised strap (*e*) (Fig. 1) forms itself into a loop as shown in Fig. 5*e*. This loop has many uses as will be shown below.

We now proceed to form a buccal tube from the loose end of the band by cutting it off to the desired length, usually $\frac{1}{4}$ of an inch. A special tube forming pliers (Fig. 6) is now used for the first step to shape the flat metal into a half formed tube. Fig. 7*a, b, c*, shows the steps to be followed; *d* shows the method used to complete the formation of the tube by inserting the desired size and shaped wire into the half formed tube and through the loop, crimping

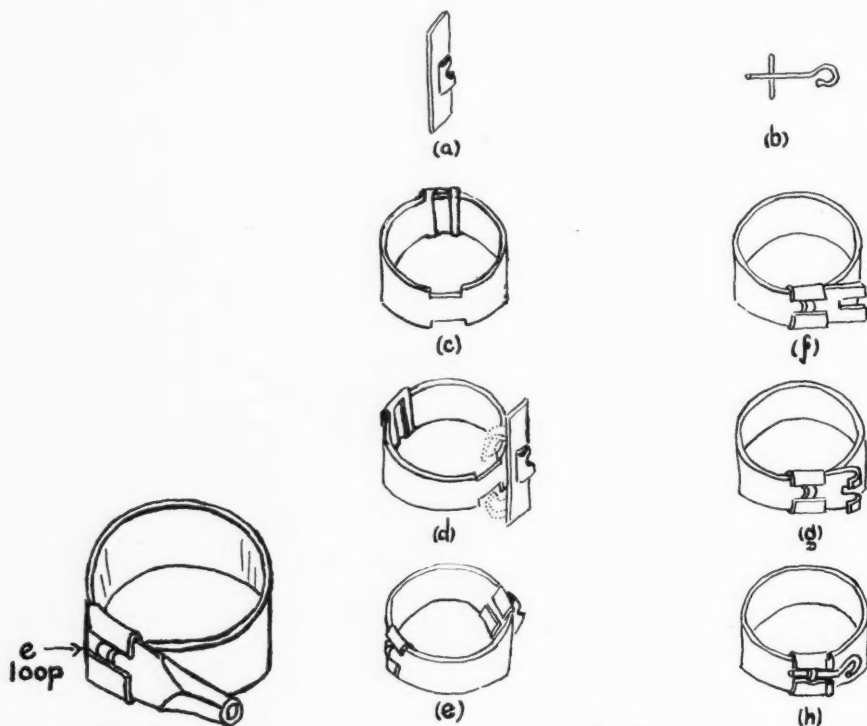


Fig. 8.—Completed molar band and tube.

Fig. 9.—Steps for the reception of the half round tube and the intermaxillary hook.

the metal around the wire with a flat nose pliers. The completed band and buccal tube is shown in Figs. 7*e* and 8.

It must be here emphasized that the entire procedure is performed without soldering or welding. When precious metal is used, the seam of the tube may be soldered. In chrome alloy no soldering is necessary because the metal is stiff and the loop also acts as a tube; the body wire must be made long enough to go through both tube and loop as shown in Fig. 7*c*.

For chrome alloy, two auxiliaries, a half round tube (*a*) and an intermaxillary hook (*b*) (Fig. 9) may be crimped onto the band. The preparations of the band for the reception of these auxiliaries are as follows: For the half round tube, after the band is formed and shaped, a notch on the occlusal and gingival ends opposite the joint is ground in with a carborundum stone, equal

to the thickness and width of the metal band (Fig. 9c). The half round tube is received and crimped into the notched area as shown by the dotted lines (Fig. 9d). Fig. 9e shows the ends crimped into position.

To attach the intermaxillary hook, the loose end of the band is cut to 3 mm. length. A slot cut into it is shown in Fig. 9f. The straight end of the hook (Fig. 9b) is placed under the loop, and the separated ends of the band are crimped around the cross-section of the hook as shown in Fig. 9g and h. Chrome alloy can be soldered with a special flux.

This band can also be used for premolars and incisors. The loop formed when the band is jointed together makes an ideal attachment for the alignment wire by ligating (the alignment wire) to the loop. The retracting of molars, premolars, and canines can be accomplished by the same means.

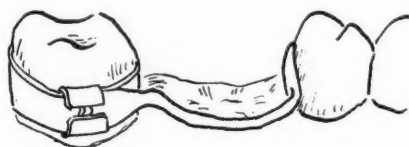


Fig. 10.—One piece space retainer.

The making of a one piece space retainer with the solderless band becomes a matter of a few minutes only. It is made direct and is constructed the same way as the buccal tube. The full length of the band's free end is used, a tube formed, and the wire which helped to form the tube is left in position for reinforcement. It is now bent to fit into the space as shown in Fig. 10.

The solderless band was primarily created for the simplification of orthodontic band construction, but since its development I have applied it to many other uses. I have successfully attached several artificial teeth to that band without soldering and have found it very satisfactory. A temporary splint can quickly be made by placing two solderless bands on opposing teeth and ligating the plain ends together.

There are many other instances in dentistry and orthodontia in which the solderless band can be used to advantage. It saves a great deal of time and energy which the professional man, at the chair, should preserve.

EVOLUTION OF A RATIONAL ORTHODONTIC DIAGNOSIS

EMMETT J. SCOTT,* B.S., D.M.D., WASHINGTON, D. C.

BLACK'S *Medical Dictionary* states: "Diagnosis is the art of distinguishing one disease from another, and is essential to scientific and successful treatment. It is in diagnosis, more than in treatment, that the highest skill is required, and, for a diagnosis, the past and hereditary history of a case, the symptoms complained of, and the signs of a disease found upon examination are all weighed.

"Often an absolute diagnosis cannot be made at once, and it becomes necessary to proceed tentatively with treatment, keeping a careful watch upon its results."

The term rational means "having reason or understanding; intelligent," and is in direct contrast to "empirical," which embodies the idea of being founded upon experiment or observation, without due regard to science or theory.

I shall attempt to show how a rational diagnosis in orthodontics is evolving by recounting opinions relative to certain salient features in the process of induction and deduction as applied to the science and to the individual.

Historically, orthodontics is as old as the general science and art of dentistry itself. Celsus, a Roman writer (25 B.C.—A.D. 50), wrote, "If a second tooth should happen to grow in children before the first has fallen out, that which ought to be shed is to be drawn out and the new one daily pushed toward its place by means of the finger until it arrives at its just position."

Moving rapidly down the centuries we find Fauchard (1723) observing, "in order to exert mechanical pressure by means of an apparatus it is necessary to have sufficient resistance to the force to be exerted"—(the first principles of anchorage).

In 1771 Hunter described the first norm concept with reference to occlusion, and in 1844 Thomas F. Bond used the word "orthodontosy"—the primitive form of the word orthodontics.

First referred to as irregularities of the teeth and, in more modern times, as malocclusion, efforts to produce a systematic classification of the various types, forms and positions of these aberrations began in 1842 with Carabelli, and passed through many hands, until we find Edward H. Angle, at the turn of the present century, producing what is our most widely known classification of malocclusion. To this we shall return later.

McCoy defines orthodontia, or orthodontics, as "a study of dental and oral development. It seeks to determine the factors which control growth processes, to the end that a normal functional and anatomical relationship of these parts may be realized, and, aims to learn the influences necessary to maintain such conditions once established." This is the modern conception of orthodontics.

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Quite naturally, before one is in a position to deal with aberrations in the denture and face, one must have a conception of what is commonly referred to as the normal denture and face. Normal, then, is defined as "in accordance with an established law or principle; conforming to a type or standard."

Occlusion is the relationship existing between the teeth when the jaws are closed; and normal occlusion is such that there is "an innocuous distribution of stress when the jaws are closed."

On examining the literature we are convinced immediately that an effort to conceive of a norm and to apply it to clinical practice in orthodontics is fraught with danger. In many instances we find the norm confused with the ideal, and the extreme is reached in this direction when we compare faces with that of the Apollo Belvidere. On the other hand, the following comments seem sufficiently pertinent:

Simon writes, "Since the conception of the normal would have to be universally applicable, not merely to one individual, but to all members of the same race; and, since all must then possess dentures of the same type in minute detail (excluding defects of formation), we realize that such an assumption contradicts our experience."

Stanton gives the following opinion, "For the determination of the normal horizontal arch form of any case of malocclusion Simon suggests Pont's table. This table is one of anthropologic averages and assumes that the arch of man has a correlation between the combined widths of the four maxillary incisors and the distance between the distal pits of the first premolars, and the mesial pits of the first molars.

1. When the combined diameters of the incisors measure 25 mm.
2. The distance between the first premolar pits is 31 mm.
3. The distance between the first molars pits is 39 mm.

"For every increase in incisor width of one millimeter a corresponding increase must be made in arch width at premolar and molar points. In other words, the form of the dental arch is always *the same geometric figure*, varying only in size as the teeth vary in size.

"Inasmuch as the head form varies in man $\left(\frac{\text{width} \times 100}{\text{length}} = 90 \text{ to } 115\right)$, the dental arch also varies. If 'normal' dentures are projected to a plane, it will be found that curves of various characters may be drawn on the summits of the buccal cusps and incisal edges. The forms of these curves will vary. Some will be arcs of ellipses, some parabolas, cubic parabolas, and others curves of unknown formula.

"Some arches will be blunt, and others of sharp curvature in the incisal area.

"Curves of 'normal' arches, if superimposed, will cross and recross, showing that there is no one form that can be used as a norm."

Hellman comments, "Interpretations . . . must imply a conception of the normal as encompassed within a borderline of such proportions that will permit of modifications in detail *without a change in type*."

Hrdlička, in *Normal Variation of the Teeth and Jaws*, writes, "At no time during the development and growth period does the dentomaxillary apparatus

represent the full and final influence of the hereditary potentialities of the individual, or the full and final results of the tendency toward adaptation. The period of puberty is often particularly active in changes.

"Whatever ideal concerning the teeth, or arches, or jaws, may be set up, there must be made an allowance of from 20 to 40 per cent of the average for the normal variation of such an ideal. Points of prospective measurement will differ in different individuals, at different ages, and even on the two sides of the head or face of the same individual."

It is frequently pointed out that the teeth of the maxillary dental arch have greater mesiodistal diameters than those of the mandibular arch. Consequently the measurement of the maxillary arch from the distal surface of the third molar to the distal surface of the third molar of the opposite side is greater than the corresponding measurement in the mandibular arch. In occluding the two jaws this greater measurement of one arch over the other produces, in the perpendicular plane, an overbite, and, in the horizontal plane, an over jet. Here, too, we are not on certain ground.

In a paper, *Primitive and Modern Man*, Hellman writes, "It is a well-established fact that in primitive man, as seen in *Homo Heidelbergensis* and *Homo Neanderthalensis*, the incisor occlusion was in 'edge-to-edge' relationship. This form of incisor occlusion seems to have been the prevailing type until a quite recent period of geologic time. As Keith points out, in Anglo-Saxon time almost the entire population possessed an 'edge-to-edge' bite. After the lapse of less than a thousand years 95 per cent of the modern Englishmen possess an overbite.

"American Indians and Eskimos possess an 'edge-to-edge' bite. The European white and the Asiatic South Indians and Mongolians present an overbite. According to Weinberger, a large percentage of American white males, when examined for military service, showed an 'edge-to-edge' bite."

Other writers find the situation varying from an edge-to-edge bite to a deep overbite, depending upon racial and typical characteristics, the pattern of the teeth, and the length of the cusps.

It is apparent that in our quest for a norm concept we are confronted by variations—variations produced and influenced by heredity and environment. It may be safely assumed that a fixed norm is nonexistent; yet we must have a guide, even though plastic, from which and toward which to reason.

Prior to the turn of this century there were many efforts to formulate a schematic classification of dental irregularities. Angle, defining the term malocclusion as "a perverted relationship between the inclined planes of the teeth"—or a "perverted occlusion," brought forth his now widely known effort.

Briefly, Angle grouped the dental deviations as follows:

Class I—Normal mesiodistal relationship between the jaws and dental arches, with irregularities of the anterior teeth.

Class II—Distal relationship of the mandible and dental arch to the maxilla.

Div. 1. Bilateral distal relationship, with protrusion of the maxillary anterior teeth.

Subdivision. Unilateral distal relationship, with protrusion of the maxillary anterior teeth.

Div. 2. Bilateral distal relationship with retrusion of the maxillary anterior teeth.

Subdivision. Unilateral distal relationship with retrusion of the maxillary anterior teeth.

Class III—Mesial relationship of the mandible and dental arch to the maxilla.

Div. 1. Bilateral mesial relationship.

Subdivision. Unilateral mesial relationship.

This classification is predicated upon the belief that the first permanent molars are the "keys to the occlusion," and that the maxillary first permanent molars occupy a fixed position and intercusate with the mandibular molars, so that the tip of the mesiobuccal cusp normally falls in the buccal groove of the mandibular first molar.

Immediately Angle, himself, recognized that if the second deciduous molar was lost prematurely, or if there was a missing second premolar tooth germ, the first molars would be in a position to drift mesially, thereby giving them an unpredictable position in a limited sphere. This he spoke of as an anomalous Class I malocclusion and rested content that all was well.

Although Angle's classification is still the most widely known and used, recent years have brought to light very definite flaws which in the long run may result in a markedly more exacting technic.

Strang gives the following as principles underlying the Angle classification:

"1. That there is a normal mesiodistal relationship of the body of the mandible and the lower dental arch to the skull.

"2. That the upper dental arch, being built upon a fixed section of the skull anatomy, is more or less stable in its relationship to the various landmarks on the head and, consequently, the first molar teeth in this arch may safely be used as the key teeth from which to judge the relationship of the lower dental arch (and the lower jaw) to the head.

"3. That, if there is a shifting of these upper molars in their relationship to the head anatomy, this variation can be detected by changes in the axial position of the teeth in the maxillary arch, especially by the canines."

Further, Angle determined the normal axial positions of the teeth by what he termed "the anterior component force." According to him, "the lower jaw travels, in its upward and downward movements, in segments of a circle. The force that is received on the occlusal surfaces of the teeth and translated through the meshing of the inclined planes to the underlying bone, must be expressed (diagrammatically) in the form of curved lines the convexity of which is face-ward.

"The outline form of the incisor crowns and roots conforms to these lines of force, enabling them to withstand their action. The roots of posterior teeth, with their distal curvature, also withstand this action.

"If a series of curved lines is drawn representing the lines of force at each tooth position and these lines intersect a horizontal curved line which represents

the occlusal arc, and, finally, chords are drawn in these curved segments: the chords will represent the axial inclination necessary to each tooth to enable it to withstand the stress of occlusion from the point of view of the 'up and down' action. The forward thrust is neutralized by muscular pull in the opposite direction from the lips, the intercuspation of teeth and proximate contact between teeth."

The fallacy of the fixed position of the maxillary first molars has been attacked from various angles by Simon, Hellman, Todd, Broadbent, Stanton, and others, from whom I shall quote.

Simon, among the European investigators, produced a book, *Systematic Diagnosis of Dental Anomalies*, in which he discounted Angle's theory of the fixed permanent molar and evolved the gnathostatic technic of diagnosis. This technic demands the orientation of the denture to the Frankfort plane and the use of the median sagittal and orbital planes as diagnostic factors. The Frank-

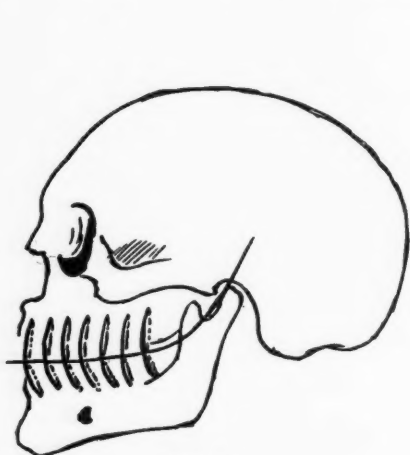


Fig. 1.

Fig. 1.—Determination of the axial inclination of the teeth by the anterior component force.

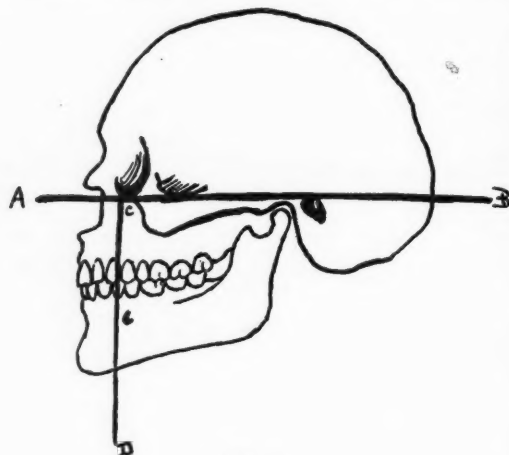


Fig. 2.

Fig. 2.—The Frankfort and orbital planes. *AB*, the Frankfort plane. *CD*, the orbital plane.

fort plane is an imaginary plane produced by drawing a straight line through the lowest point of the orbits and the highest points of the auditory meati.

The orbital plane depends upon what he calls "the gnathostatic orbital point." This point lies on the skin at the lower bony margin of the orbit, perpendicularly below the pupil, when the head is in proper balance and the eye is fixed at a point straight ahead. If a perpendicular is erected upon the Frankfort plane, using the orbital point as the contact guide, the result is the orbital plane. In profile, jaw-dental arch relationships are to be determined by their relationship to this plane—and here, according to recent investigators, Simon substituted, for Angle's mistake, one of his own.

He assumed that the orbital plane always passed through the maxillary cuspid, and that, therefore, the cuspids were fixed points.

Broadbent states, "In an examination of a series of seventy-five sample skulls, devoid of malocclusion, from a collection of 800, the closest position of the

tip of the upper canine with relation to the orbital plane was 2 mm. to the mesial of said plane, while the most distal position was 19.4 mm. to the mesial. In one of the cases the orbital plane passed through the mesiobuccal cusp of the upper first molar." His conclusion, "In view of the variability of facial points in their relationship to the orbital plane, it seems clear that no one of them is stable enough to warrant its use as an invariable guide in orthodontic diagnosis and treatment. Least stable of these points is the canine point."

It seems that, in endeavoring to establish a means of diagnosis, the points usually established as orientation media prove unreliable, because in orthodontics one deals with children, and growth factors unbalance a schematic diagnostic chain.

Todd believes that, "During childhood the human orbit grows in height. This growth is not upward from the Frankfort plane, but is downward from the cranio-facial diaphragm and the orbital roofs. The lower border of the orbit, therefore, is unstable as an index for measurements."

Returning briefly to the hypothetical fixed position of the first permanent molars, Hellman states, "The position of the face is not constant. It varies, and this variability is in an anteroposterior direction. If the entire face varies, it necessarily carries with it both dental arches. It would seem that, under the circumstances, the assumption that the position of the upper first molar is constant is erroneous, and, using it as a basis to classify malocclusion of the teeth is not in keeping with the actually prevailing conditions."

The logic which serves as a background of these critiques of current methods of classification is found in researches in the field of growth and development, comparative anatomy and anthropology. Contributions from these investigators are building rapidly toward a more stable and rational concept of orthodontics.

Changes in the Human Face Brought About by Development (Hellman) advances five stages of development of the human dentition and two of retrograde changes:

- "1. The period of early infancy, before the completion of the deciduous dentition.
2. The period of late infancy, at the completion of the deciduous dentition.
3. The period of childhood, when the first permanent molars are erupting, or have taken their places, in addition to which some or all of the deciduous incisors have been lost and are replaced by their permanent successors.
4. The period of pubescence, when the second permanent molars are erupting or have taken their positions, in addition to which some or all of the deciduous canines and molars are being succeeded.
5. The period of adulthood, when the third molars are erupting, or have taken their places.

The retrograde changes are:

1. The period of old age, when occlusal surfaces are worn off to the extent of obliterating the pattern of grooves.
2. Senility, when at least one-half of the crowns are worn off, in addition to which some, most, or all of the teeth have been lost."

Returning to Todd, "From about seven months to the end of the second year there is a little vertical facial growth but none anteroposteriorly. During the third and fourth years facial growth occurs in both directions but is mainly vertical. Between four and seven years, growth is entirely horizontal. This accompanies the later stages of development and eruption of the first permanent molar.

"The downward and forward growth of the face is continued until the end of the eleventh year, and thus the developing second molar is accommodated. Thereafter, until sixteen years, there is little change. Between sixteen and nineteen years there is again forward and downward growth and space is prepared for the third molar."

Regarding the lateral development of the jaws, Wallace states, "During the transition from the deciduous to the permanent dentition the width is materially increased and usually reaches a value greater than that in the permanent denture. The distance between the second deciduous molars reaches its maximum value at $9\frac{1}{4}$ years, and is reduced by 1 mm. at twelve years."

This is amplified by Sved as follows, "The intercanine width is 1.6 mm. wider at nine and a quarter years than it will be at the age of twelve years. Between the ages of seven and nine years the total increase in intercanine distance is 3 mm. With the eruption of the first permanent molars an acceleration of lateral growth occurs, and in about 18 months to two years the maximum arch width during life is attained." (About nine years of age.)

This field presents a wealth of material which cannot be appreciably considered here, much less exhausted. The close harmony between orthodontics and anthropology is producing a rapidly changing standard in orthodontics. It is now more fully realized than at any previous time that the denture of man is not an independent organ, but must bear an intimate relationship with the facial lines, cranial development and the general evolution of the species.

The differentiation of Man from his ancestors, his assumption of an erect posture, a bipedal system of locomotion, loss of the snout of his proximate ancestors, development of a larger brain case, not to omit its more highly specialized contents, are all aiding us in our quest for understanding of diagnostic and prognostic principles.

It is interesting to note that on the whole the teeth of Man are not radically different from those of his ancestors. The principal changes in the teeth are due to a change in their mode of use, loss of the need for prehension, no great need for the type of cutting demanded by grazing and a differentiation in general to facilitate the ingestion of a mixed diet. Brash states that "in the period between fossil and modern man the bony structures have been more responsive to changes in use and environment than the teeth."

Anderson, in the new revision of Dewey's *Practical Orthodontia*, estimates that the orthodontic practitioner has about 15 to 20 per cent of failures in his treatment of cases. This he assumes to be a relatively fair average of success.

In view of the fact that 81 per cent of the etiologic factors in orthodontics are assumed to be purely local (and this includes habits to the extent of 25 per

cent) while the congenital and unclassified factors make up the remaining 19 per cent (Brandhorst), it seems to be a rather safe deduction that the current percentage of success is due to the accuracy with which obvious and thoroughly understood causes are diagnosed, and to the efficiency of the mechanical contrivances used in treatment.

Conversely, a fair percentage of the failures must be due to inadequately understood and obscure causes, with the balance due to miscellaneous administrative mishaps.

I shall not devote attention to the purely local and well-understood causes of malocclusion. It is necessary, however, to consider briefly the contributions to the understanding of the obscure group.

With regard to inherited dentofacial characteristics Thoma comments, "Distinctive abnormal conditions are transmitted by inheritance. An example of this kind is the historical 'Hapsburg jaw,' a condition of mandibular prognathism; another is the 'Bourbon nose.' It is, therefore, not surprising that interbreeding of races results in various forms of abnormalities in the face and jaws. In the pure races of Laplanders, Polynesians and old Hawaiians malocclusion seldom occurs."

In commenting upon genetic variations, Alfred Russell Wallace says, "When asexual generation prevails, the characteristics of the individual, alone, are reproduced, and there are no means of effecting the change of form or structure required by changed conditions of existence. Under such conditions a complex organism, if only asexually propagated, would become extinct. But, when a complex organism is sexually propagated, there is an ever-present cause of change which, though slight in any one generation, is cumulative, and, under the influence of selection, is sufficient to keep up the harmony between the organism and its slowly changing environment."

When we attempt to attribute some dentofacial deformities to intrauterine pressure, we find a difference of opinion among investigators. Thoma believes that "asymmetry of the head and face may be caused by excessive or asymmetrical moulding at birth, or by uneven growth due to mechanical pressure in utero."

Parmelee attributes such deformities to "intrauterine flexure of the head, producing pressure of the jaw against the shoulder."

Bery may be quoted as follows: "The normal headbend of the fetus is accentuated by forces, or pressure, of an external nature, causing the floor of the mouth to approach the roof of the primitive buccopharyngeal cavity. This pressure can push the nose and hard palate backward, changing the direction of the palate. . . . These malformations are produced by amniotic pressure."

On the other hand, Brash believes:

- "1. The pressure of the liquor amnii is an equable one, according to the hydrostatic law.
- "2. The embryo in utero has as its peripheral pressure not only the liquor amnii but the general intraabdominal pressure, and any small, or even large, increase in the former can have no significance.

"3. A local mechanical pressure between the third and eighth week seems irrational.

"4. Even if one granted the pressure, there is no evidence that it would affect the bones, whose deformities are characteristic of achondroplasia."

It is admitted freely that developments in the field of endocrinology may add materially to our understanding of certain deformities of the face and denture. While the classical descriptions of dysfunction of the endocrine glands deal primarily with extremes, it is logical to contemplate the effects which may be produced by slight deviations from normal function in these little understood parts of the body.

Quoting fragmentarily from Bery, Thoma and Wilkinson, we find, "The thyroid gland is intimately associated with the metabolism of the body. It stimulates oxidation, participates in the control of growth, and, in combination with other ductless glands, governs calcium metabolism, and aids in the neutralization of toxins. . . . The hypothyroid individual . . . suffers from retarded eruption of teeth and retarded absorption of deciduous roots.

"The thymus gland regulates calcium-phosphorus metabolism during childhood, controls bone growth and regulates the growth and activities of the sexual organs during childhood. The juvenile thymotrope has the teeth of a baby. They resemble bluish porcelain, are thin, translucent and have a tendency to 'scallop.' (Mammelons.) If the function of the thymus is impaired, enamel defects, retarded bone growth and faulty mineral metabolism ensue.

"The anterior lobe of the pituitary gland presides over the bone production of the long bones and face. Hyperactivity produces acromegaly, protruding maxillae, large head and prominent forehead. It tends further to produce overdevelopment of the mandible causing macromandibular development and (Class III, Angle) malocclusions. Hypoactivity leads to a high vaulted, crowded arch—or to a widespread arch with 'spacing' of the teeth and irregularity."

"Atrophy or injury to the thyroid gland . . . results in a wide and flattened palate, nonunion of the mandible, underdevelopment of the chin, and malocclusion."

Wilkinson reports two cases attributed to hyperfunction of the pituitary gland as follows:

"Case I. A child of ten years, the youngest daughter of an acromegalic father. During a period of five years' observation the anteroposterior relationship between the jaws remained unchanged. Recently, however, the mandible has commenced to lengthen and the teeth to assume a Class III relationship.

"Case II. A boy of eleven years presented with a Class I malocclusion, was treated and dismissed. At fifteen he returned with a Class III malocclusion and an open-bite. It was found subsequently that his father had a similar condition."

"In between the extremes of giantism and dwarfism there are numerous middle course cases in which there is only a slight deficiency in or overgrowth

of bone. These slight variations undoubtedly produce many of the malocclusions which confront us today." (Anderson.)

There is a wealth of material in this field, sufficient to satisfy the inquisitive, acquisitive, or critical reader. It is much too broad to encompass it here.

I cannot conclude without a brief excursion into the field of habits and their effect upon the human face and denture, and, although no phase of treatment is here discussed, I recommend heartily your perusal of the myofunctional methods of treatment of certain types of malocclusion with which muscular habits are associated.

Brash has classified habits as follows:

- "1. Those in which the muscles of the mouth and jaws take no active part, effects upon the positions of the teeth being produced by extraneous pressure. (In this group are the posture habits: 'pillowing,' 'the chin in palm rest,' etc.)
- "2. Purely muscular habits. (Lip, tongue, or jaw thrusting.)
- "3. Muscular action combined with the introduction of passive objects into the mouth (the use of 'pacifiers,' pencil biting, etc.).
- "4. Those in which there is a combined activity of the muscles of the mouth and jaws, and of a thumb, or fingers, inserted into the mouth. This is probably the most potent."

"Malocclusion is a mechanical process. The function of the brain is also a mechanical process. It follows that perverted mechanics of the denture can upset the mechanics of the brain, and, conversely, improper functioning of the nervous system can, and does, upset the mechanics of the denture.

"We may divide habits that are factors in the development of the denture into two groups—those which are caused by the denture and those which are caused by the nervous system.

"It is possible for poor mechanics to change the structure of the muscles of the face and tongue to such an extent that they feel uncomfortable. The constant effort to adjust them to a more comfortable position, if carried to the point of automatism, will become a habit."

With reference to habits, and specifically to thumb-sucking and object sucking, G. V. Hamilton says, "If any of the basic needs of a primate remain unsatisfied for a considerable period of time, appropriate endogenous stimuli are apt recurrently to dominate the organism's adjustive functions. At such times striped muscle and visceral innervation tend to be set persistently for the quest and utilization of whatever may be required to satisfy unsatisfied needs. . . .

"Suckling calves, colts, lambs, pigs, kittens, puppies and the human suckling tend to react to endogenous stimuli *other than hunger* and to exogenous stimuli *other than food* by sucking. A calf which has suckled its mother to repletion is apt to bawl and run about the pen as if seeking access to her. If it encounters the experimenter's finger, it will suck vigorously—but if turned out with its mother it will not suckle her.

"The suckling infant, when too sleepy to play, or if put to bed by itself, or if insufficiently entertained, is notoriously apt to suck its thumb, or any plaything which lends itself to this behavior.

"Thumb-sucking is not, in my opinion, necessarily preferred to the sucking of objects which are not a part of its own body.

"We cannot doubt that the stimuli derived from sucking movements . . . satisfy some sort of normal craving in addition to the craving which comes from nutritional needs. Since the tendency to suck, which has at first a predominantly nutritional value, has ultimately a value for the perpetuation of the species, there is ground for regarding its manifestation in children in response to other than food and hunger stimuli as a prepubertal tendency from which is derived a component of the adult total hetero-sexual tendency."

Thumb-sucking, when it becomes a habit, produces a protrusion of the maxillary teeth on the side corresponding to the thumb used. In order to produce a reduction of the effects without mechanical intervention it is imperative that the habit be broken before the fifth year.

The tongue is a factor of unreliable etiologic significance. Ordinarily it influences the growth of the jaws. If overdeveloped and used as a habit component, it will produce malformations, chief among which is an infraclusion of the anterior teeth—commonly called open-bite. If small and atonic, a constricted arch may result, particularly if other factors are present. However, it is not reliable, for in some mouths with a large, powerful tongue the organ itself becomes indented with no apparent effect upon the denture.

Mouth-breathing is usually a forced habit produced by an effort on the part of the subject to compensate for a partial occlusion of the nasopharynx by hypertrophied tonsils and adenoids. Mouth-breathing interferes with the blood supply of the membranes of the nose, mouth, throat and maxillary sinuses, alters atmospheric pressure in the mouth, and throws counteraction between the buccinator and the tongue out of balance so that the buccinator exerts a constrictor action upon the denture, producing a high vaulted, V-shaped arch.

In retrospect then, we are able to draw the following conclusions:

1. Until and including the present, our norm concept of occlusion is subject to criticism because it contains basic flaws, the fundamental flaw being the isolation of the denture from the rest of the face and the cranium.
2. There is the need of a norm concept predicated upon a wider standard of judgment.
3. It is improbable that there is a fixed normal in nature, hence our norm must be a usable fiction, and subject to a variation of from 20 to 40 per cent.
4. Progress in the fields of anthropology, genetics, natural history, and comparative anatomy will bring about a more rational approach to the diagnosis and treatment of dentofacial anomalies in all divisions of dentistry.
5. Further understanding of the causative factors in habit formation, the myofunctional deviations produced by habits, methods of breaking the habits and reeducating hypo- and hyperfunctional musculature has a direct bearing upon the natural development of orthodontics.

REFERENCES

- Anderson, George M.: *Dewey's Practical Orthodontia*, St. Louis, 1935, The C. V. Mosby Co.
- Angle, Edw.: *Malocclusion of the Teeth*.
- Badcock, J. H.: *Orthodontics: A Survey*, INT. J. ORTH. 18: 325, 1932.
- Bery, N. N.: *Our Present Knowledge Regarding the Etiology of Malocclusion*, INT. J. ORTH. 18: 22, 1932.
- Blumenthal, Fred: *The Problem of Oclusions With Missing Teeth*, INT. J. ORTH. 17: 921, 1931.
- Brash, J. C.: *The Growth of Alveolar Bone*, INT. J. ORTH. 14: 196, 283, 398, 487, 1928.
- Idem: *The Etiology of Irregularities of the Teeth*.
- Broadbent, B. Holly: *Investigations on the Orbital Plane*, Dental Cosmos, August, 1927.
- Chapman, H.: *Some Notes on Normal Occlusion*, INT. J. ORTH. 21: 1027, 1935.
- Hamilton, G. V.: *Psycho-pathology*.
- Hellman, Milo: *Variation and Anatomy of the Jaw Bones*, J. A. D. A., March, 1927. *The Orbital Plane*, INT. J. ORTH. 16: 418, 1930. *The Relationship of Form to Position in Teeth and Its Bearing on Occlusion* (Reprint). *The Face and Occlusion of the Teeth in Man*, INT. J. ORTH. 13: 921, 1927. *Introduction to the Growth of the Human Face from Infancy to Adulthood* (Reprint). *The Face and Teeth of Man*, J. D. Res. 15: 135, 1929.
- Howard, C. C.: *A Study of Jaw and Arch Development Considered with the Normal and Abnormal Skeleton*, INT. J. ORTH. 12: 1, 1926.
- Hrdlička, Aleš: *Normal Variation of Teeth and Jaws*, INT. J. ORTH. 21: 1099, 1935.
- Hellman, Milo: *Angle's Classification of Malocclusion: An Interpretation*, Dental Cosmos, 1920.
- Key, J. A.: *Bone Atrophy and Absorption*, INT. J. ORTH. 15: 949, 1929.
- Kirk, Edw. C.: *Evolution of the Human Dentures*, Dental Cosmos, June, 1930.
- Krogman, W. M.: *Ectocranial and Endocranial Suture Closure in Anthropoids and Old World Apes*, Am. J. Anat. September, 1930.
- McCoy, J. D.: *Applied Orthodontics*.
- Monson, G. S.: *Architectural Bone Changes of the Face and Cranium*, Tr. Seventh Int. Dental Congress.
- Rogers, A. P.: *Coordinating Natural and Artificial Methods of Treatment*, INT. J. ORTH. 10: 63, 1924.
- Idem: *Living Orthodontic Appliances*, INT. J. ORTH. 15: 1, 1929; also *Dewey-Orthodontia*.
- Schwarz, A. M.: *Tissue Changes Incidental to Orthodontic Tooth Movement*, INT. J. ORTH. 18: 331, 1932.
- Simon, Paul W.: *Systematic Diagnosis of Dental Anomalies*.
- Stanton, F. L.: *A Critique of Simon's Diagnostic Methods*. (Reprint.)
- Sved, Alexander: *Growth of the Jaws and the Etiology of Malocclusion*, INT. J. ORTH. 21: 799, 928, 1013, 1126, 1935.
- Todd, T. W.: *Facial Growth and Mandibular Adjustment*, INT. J. ORTH. December, 1930. *Skeletal Adjustment in Jaw Growth*, Dental Cosmos 16: 1243, 1926.
- Thoma, Kurt: *Clinical Pathology of the Teeth and Jaws*.
- Tomes, C. S.: *Studies on the Growth of the Jaws*, Tr. Odontological Society of London.
- Waugh, L. M.: *A Study of the Nutrition and Teeth of the Eskimos*, J. D. Res. 1928, 1930, 1931, 1932, 1933.
- Wilkinson, W. Stanley: *The Influence of Prognosis Upon Orthodontic Therapy*, The Angle Orthodontist, 1935.
- Weinberger: *The History of Orthodontia*.

TREATMENT OF DAMAGED INCISORS IN CLASS II, DIVISION 1, CASES*

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IN THE INTERNATIONAL JOURNAL OF ORTHODONTIA, 1933, is published a questionnaire entitled "Fractured and Lost Anterior Teeth." Circulated by the Detroit Clinic Club, it deals with treatment very thoroughly, and, as stated in the summary, it contains a wealth of valuable information. It is composed as follows: What is your method of treatment and restoration in the following cases?

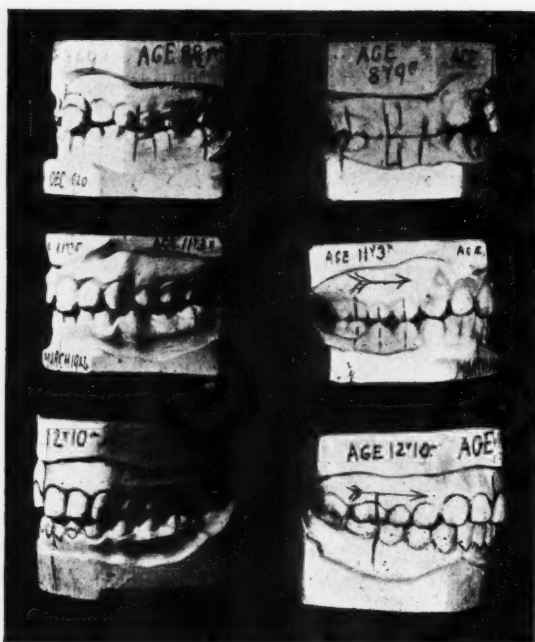


Fig. 1.

1. Child, aged eight years, maxillary central incisor lateral fracture with incisal half lost, with desensitized pulp protruding from the tooth.
2. Child, aged eight years, maxillary central incisor lateral fracture with incisal half lost, with pink showing through the dentin.
3. Child, aged eight years: (a) a maxillary central incisor lost; (b) two maxillary central incisors lost.

The questionnaire invites no mention of the closure of the spaces by treatment or otherwise, but I find one allusion to the fact that the spaces will close up sometimes or can be caused to close up in favorable cases. A correspondent incidentally remarks that he has seen many cases in which the space created by the loss of incisors has been closed by the remaining teeth.

*Transactions of British Society for the Study of Orthodontics, 1934.

To treat the subject completely would necessitate a long paper; the consideration of the loss from the deciduous, transitional and permanent dentition, and the adolescent stage, would spread itself over too wide an area to be covered in a short communication.

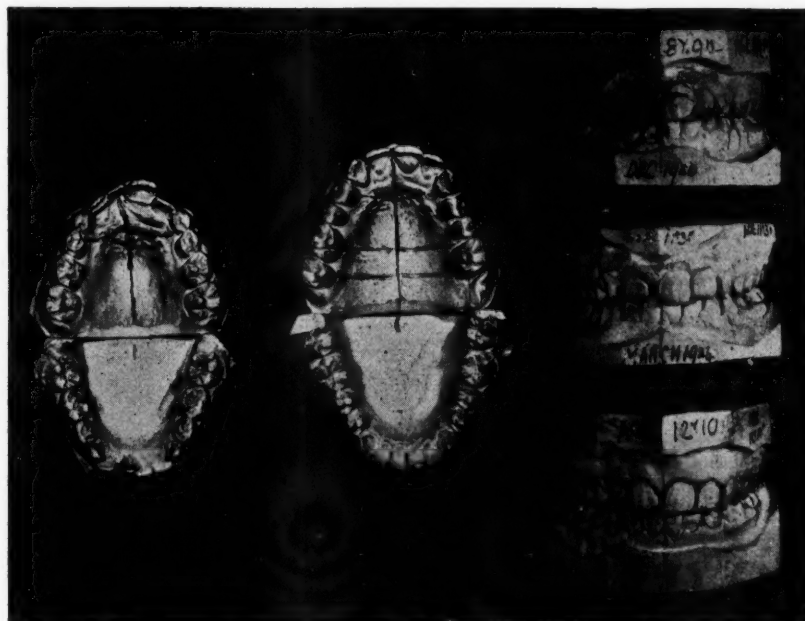


Fig. 2.



Fig. 3.

The general practitioner, who is more frequently in contact with the result of focal sepsis, would, we know, approach the subject from a different point of view from the orthodontic purist; hence the difficulty which he will sometimes experience in these cases in accepting the recommendation of the specialist, however ideal. It is a platitude to observe that the orthodontist who has had general experience is best qualified to advise. Conversely, the general practitioner who

has taken the trouble to acquaint himself with the views and skilled work of an efficient orthodontist will realize his own deficiencies better when called upon to decide on the best course of treatment in such cases.

In Britain, called "the land of compromise," we have this Society in which extreme views in either direction, that of conservatism or extraction, are freely expressed. Here we tend to act as a clearing house between different schools of thought and technic in treatment. In order to aid those children who from various circumstances, pecuniary or otherwise, cannot come within the circle of true orthodontic treatment, we have at times to adopt a course in which, while partly surrendering the esthetic and oclusal ideal, we evolve a line of practical treatment.

From time to time cases are brought forward which in turn show either the dangers or the advantages of extraction. Last June, Mr. Bocquet Bull showed

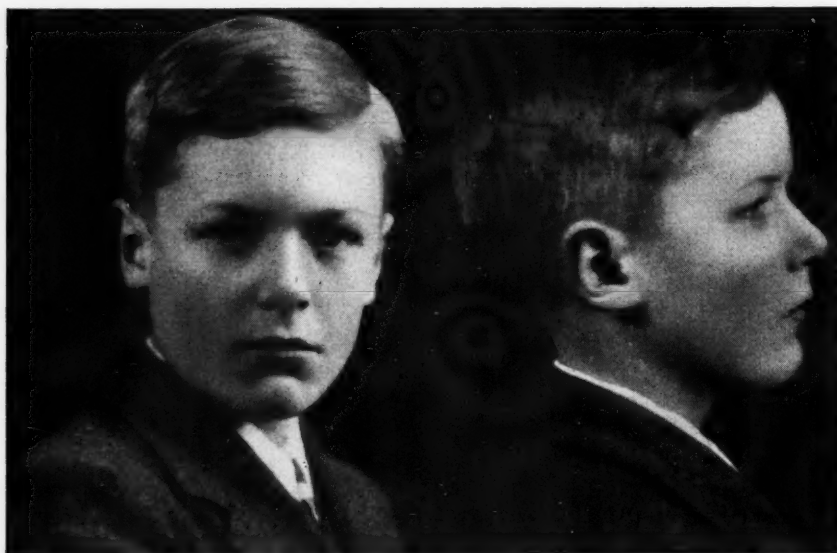


Fig. 4.

a case in which a girl, after losing two central incisors, was instructed by her mother to press on the remaining incisors to bring them together, and as a result they closed up. Another member at the same meeting pointed out that a patient of his, as a lad, had lost two incisors, but at twenty years of age he still had an unsightly gap the width of one incisor. During a paper by Mr. Lewin Payne, in which he brought forward a case of suppressed incisor teeth, Mr. Cutler asked a pertinent question as to whether in the case of the absence of two maxillary lateral incisors, the mandibular arch should be reduced by the extraction of a pair of teeth to keep the arches in balance. These and other incidents led to my selecting the three cases which I now show.

Fig. 1 shows a photograph of the original model of a child aged eight and one-half years, taken in 1920. The occlusion seemed to be normal, but if the models were turned so as to show the lingual view, a small amount of tilting could be detected. The second photograph was taken in 1924. The space was closed in about ten months. There had been a gradual drift forward of the maxillary right molar; this can be seen in the third photograph. The

lateral incisors in this case happened to be very big and square, which was a helpful factor in deciding the treatment. The patient is now about twenty-three years of age; no relapse has occurred, the case remaining very satisfactory.

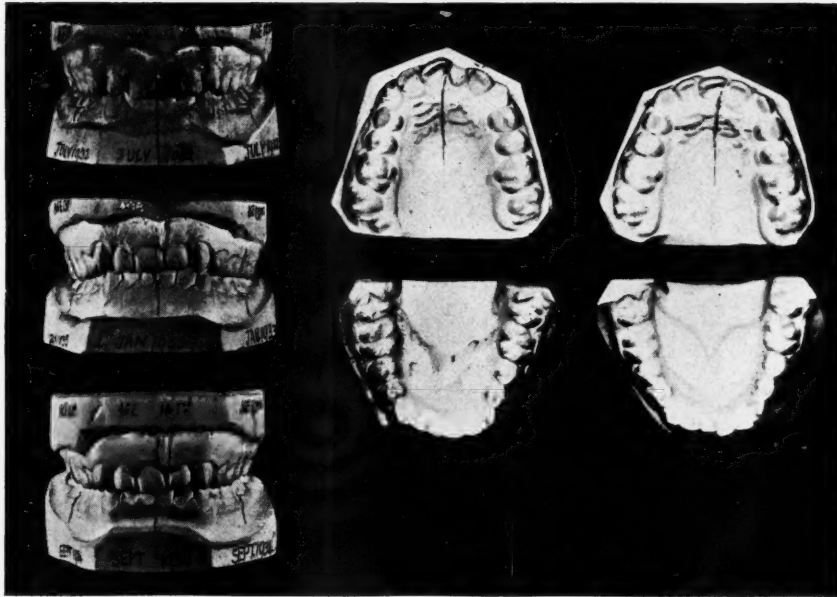


Fig. 5.



Fig. 6.

A photograph of the profile (Fig. 3), taken within the last eight months, shows a weak chin, but that does not affect the patient's character, for she possesses a very strong one. In the full face photograph it is not difficult to observe asymmetry, but I do not think it is noticed unless the face is in repose, which owing to the temperament of the individual is not usual.

The second case (Angle's Class II, Division 1) was that of a boy of twelve or thirteen. In consultation with my partner, Mr. Buckley Sharp, I decided to remove the left maxillary central incisor from which the pulp was protruding. It was not such an ideal case for the treatment as the first, but the appearance was satisfactory. The time taken in the closure, nine months, did not affect the case very much; it was not advisable to hasten over it. The boy had a very



Fig. 7.

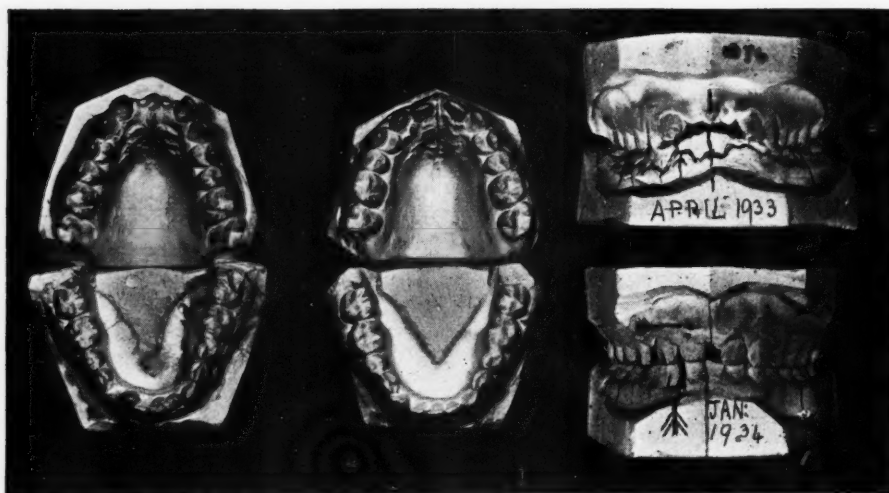


Fig. 8.

short upper lip, which was usual in such cases. If one considered other forms of conservative treatment, a rather large exposure of teeth might be shown when the child smiled. When the size of the arch had been reduced anteriorly, it was not nearly so startling. A full face photograph of this case showed that slight separation of the incisors had occurred, but not sufficient to interfere with the boy's facial appearance, even when he smiled. (Figs. 4-6.)

The third case is one of my partner's (Mr. Grayson), and is now under treatment. There had been a loss of two central incisors. I understand that the

case is progressing satisfactorily both in facial appearance and in occlusion. (Figs. 7 and 8.) Shortly after the loss of the two central incisors, it was found advisable to reduce the extent of the mandibular arch, and remove the right mandibular lateral incisor. I myself have not seen the boy, so I cannot say what effect the treatment will have in the end, but I will endeavor to obtain photographs of the final appearance.

On the whole, I think that in Class II, Division 1 cases, where there is a loss of two central incisors, it is advisable to remove one mandibular incisor, but there are some other cases in which it is advantageous to keep a well-supported occlusion, for there would not be the tendency for the mandibular incisors to strike the maxillary cingula, and the bite would not lose in height and so drive the maxillary teeth forward again and separate them. During the treatment of the first case I wondered several times whether I should take out the mandibular incisor, but I very soon saw that it would be wiser not to do so.

DISCUSSION

Mr. Harold Chapman said he noticed that Mr. Stephens used the word "drastic" in regard to the treatment of removing a damaged central incisor. If by "drastic" Mr. Stephens meant it was best for the patient, then he agreed with him, but if by "drastic" Mr. Stephens meant drastic in the ordinary way he did not know that he agreed with him. Personally he thought the treatment was by far the best. The principle he adopted was to eliminate, as far as he could, the possibility of his patients having to wear any artificial substitutes until there was really no alternative. He could recall keeping the space in only one case, and that was a Class II, Division 1 case, of a very large central incisor. He allowed the space to close for a short time; then the appearance seemed to be getting beyond anything he could put up with, so he restored the space again, and, of course, the patient had to have an artificial substitute. In all other cases which he had had to treat by removing central incisors, he had closed the space.

Certain cases of the type in question, in which the central incisor had *not* been damaged, did very well. He had shown one recently at a meeting of the Society. In that case (Class II, Division 1) one central incisor was considerably buccal to any other teeth. In eighteen months the space almost closed without any treatment whatever, and he thought that probably it had entirely closed by now.

He had been extremely gratified by the effect of removing lateral incisors. He found that in Class II cases (Divisions 1 and 2) removal of the lateral incisors in suitable cases allowed good alignment of the teeth to be obtained with little treatment, and the retention was considerably simplified and shortened. Early in the present year he had shown at a meeting of the Society a case of a child (Class II, Division 1) who had had two lateral incisors removed, with very satisfactory results. He was sure that in that case the treatment was a great deal better than wearing an apparatus for many years, as would otherwise have been necessary.

The case might be one in which extreme close bite was present, the mandibular incisors all coming along up *here* and the two maxillary canines being locked against the front part of the mandibular arch. Unless that close bite could be relieved, it was quite obvious that one must treat around *that* space unless the mandibular arch collapsed or unless one was prepared to collapse the mandibular arch oneself. If a close bite was present, the prognosis was often best decided by leaving a bite plate in for two or three months, or longer if necessary, when, having obtained considerable opening, one could actually constrict the intercanine space as well. That all helped in getting the premaxillary part of the maxilla remodelled on the palliative plan of treatment. If there was considerable crushing of the front teeth and one front tooth had come to grief, there again the prognosis was very much better. Taking into consideration the case in which the bite was open and it was a question of just remodelling the remaining three, quite a ready method was to have a band on the first permanent molars with a simple arch of 0.8 or 0.9 mm.

The Chairman said he thought that in most cases, particularly in Class II cases, in which there was maxillary protrusion, if a tooth was damaged or was going to be a nonvital tooth for the rest of the life of the patient, the best treatment was that described by Mr. Stephens. At the present time he had three cases on hand where children had met with an accident. In two of the cases it had been in the swimming baths, the children having dived into the water and damaged their front teeth. One was broken off very nearly level with the gum and the nerve was exposed. In such cases one was faced with either extraction or a crown. In cases in which both are possible it is better to get rid of the tooth. He had a very simple and useful little appliance for bringing two teeth together in a parallel fashion (Fig. 1). It was a very easy method and it worked like magic. He thought Mr. Stephens was to be congratulated on his results, which were certainly very much better than those obtained by trying to keep the dead roots.

Mr. Robert Cutler said that Class II, Division 1 cases were exceptionally difficult to treat by themselves, but when an incisor had been lost it often proved to be a complication of the first magnitude. The very nature of the defect of the Class II complex predisposed a child to an accident of that type. One of the most important points was to decide the prognosis so far as successful closure was concerned.

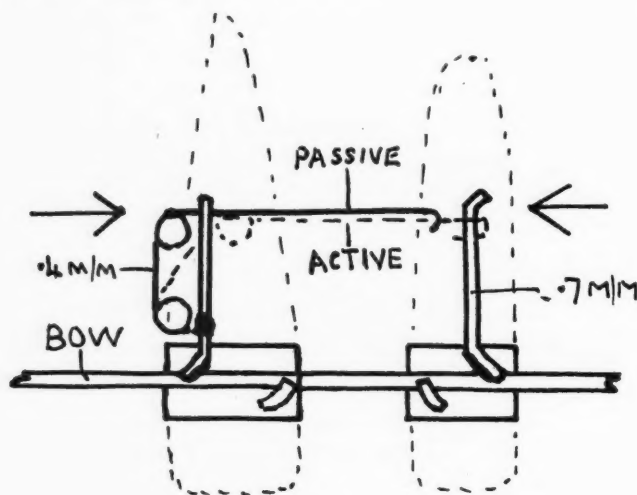


Fig. 1.

For instance, if the incisor overbite was excessive (so usual in Class II, Division 1 cases), it would be found that the maxillary canines were more or less locked between the labial aspects of the mandibular canines and first premolars so that it would be virtually impossible for the remaining three incisors to become nicely rearranged either spontaneously or by mechanical means. In such cases the prognosis would depend upon the extent to which the incisor bite could be "opened" as by so doing there would be far greater scope for remodelling the premaxilla. Again, a further favorable point in the prognosis was in cases in which considerable crowding of the incisors had been present prior to the accident, as the tendency to spontaneous closure of the remaining tooth units would be much more marked. In such circumstances it would seem that the first stage of treatment should be the building up of the bite, as when this was achieved the intercanine space could be actually constricted, this helping the remodelling process while at the same time diminishing the risk of tilting the remaining incisor, so far as less movement of the latter would be required. For this remodelling process a fixed appliance was much to be preferred and could take the form of molar band anchorage to the first permanent molars with a free sliding arch passing through a well-fitting split tube attachment to the major incisor unit remaining. Independent movement (toward the midline) of such a tooth could be arranged on this arch while general retraction of all the premaxillary tooth units was effected by the application of a suitable retracting force to the free sliding arch itself.

Mr. O. Henry said that a certain well-known film star with a wonderful smile had only one central incisor, having lost one when he was a boy.

Department of Oral Surgery

Edited by

ROBERT H. IVY AND KURT H. THOMA

Articles on oral surgery, radiography, and anesthesia should be submitted to Dr. Robert H. Ivy, 1930 Chestnut St., Philadelphia, Pa. Articles on oral pathology should be submitted to Dr. Kurt H. Thoma, 47 Bay State Road, Boston, Mass.

HULLIHEN, THE ORAL SURGEON

EDWARD C. ARMBRECHT, D.D.S.,* WHEELING, W. VA.

INTRODUCTION

IN THE presentation of a paper entitled "Clinical Oral Surgery" read before the Academy of Stomatology, Philadelphia, Pa., on January 27, 1931, a reference was made to the work of S. P. Hullihen, M.D., D.D.S. (1810-1857), of Wheeling, Virginia, in which he was designated as the pioneer and father of oral surgery in America, a title which it was claimed could properly be given him without reflecting in any way upon the reputation of Professor Garretson, of the University of Pennsylvania, whose distinguished career only a few years later than Dr. Hullihen's did so much to establish oral surgery as a distinct branch of surgical practice.

Not long after the above mentioned meeting in Philadelphia, I had the privilege of an extended conference with Professor Chalmers J. Lyons, of the Department of Oral Surgery of the University of Michigan, in which it was agreed that Dr. Hullihen's part in the very early beginnings of oral surgery was of great importance in the history of that branch of medicine and that all of the available facts about his work ought to be collected and made a matter of record.

In accordance with this suggestion I have spent much time in the past five years gathering the data given in this paper, which I trust will establish the right of this citizen of Wheeling to be called the "Father of Oral Surgery."

Oral surgery represents today a distinct and important branch of medical science and in the matter of human welfare and happiness means much to all who have need of its skill. The mouth is the avenue of many diseases. It is close to the seat of consciousness. Its healthy state is, consequently, an important factor in general physical health. In the pioneer days of a century ago when medicine was all-embracing, this Wheeling physician decided that he wanted not only to know something about everything connected with the bodily machine, but that *he* wanted to know more than was known about some special part of it: that part to be the face and mouth and the associated organs and structures.

A hundred years ago men who undertook medical specialization were real pioneers. It was an age of generalization as compared with our conditions today

*From the oral service of the Ohio Valley General and Wheeling Hospitals.

when every field of science and art is split up into very limited sections and divisions of knowledge. That specialization is of great value is now generally admitted, for intense application to a limited field tends to uncover new facts and develop new skills and sounder conclusions; but it goes without saying that such work demands of the pioneer not only keen powers of observation but also a deep faith in the value of a narrowed range of study.

The purpose of this paper is to present certain facts in support of the writer's belief that this citizen of Wheeling was actually the founder of the specialty of oral surgery.

A PIONEER IN ORAL SURGERY

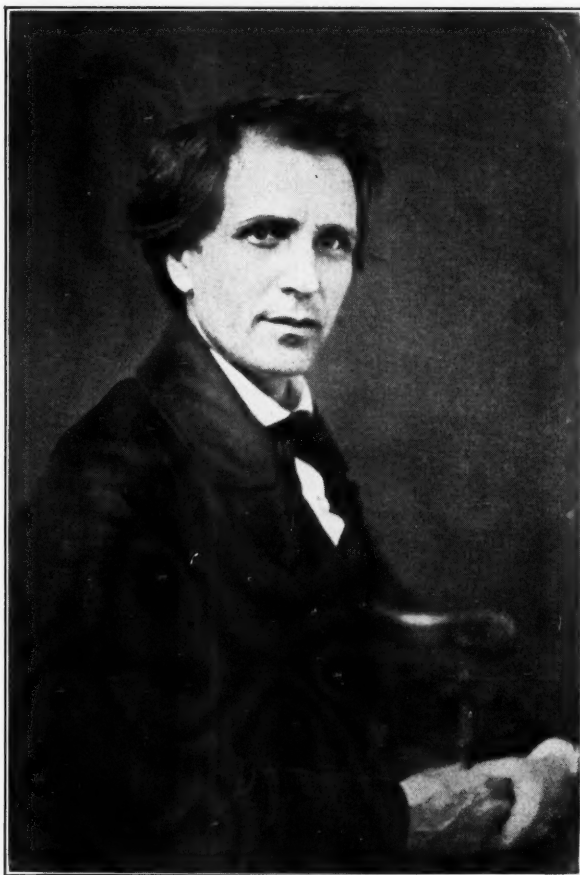
In the Hullihen oral clinic of the Wheeling Hospital hangs the portrait of a man who is accounted the founder of that institution of mercy. This is an interesting portrait. The artist shows us a strikingly handsome man: a high thoughtful brow, a firm kindly mouth, a face in which strength, enthusiasm, and consciousness of mastery are clearly written. It is the eyes of this man, however, that most intrigue the interest of the observer. In them alone one seems to find all that is shown in the portrait as a whole: energy, penetration, power, confidence, and in addition to these, paradoxically perhaps, a profound gentleness and benignity. Studying the picture, one decides that it is this unique combination of gentleness and strength that gives the portrait its special charm; and, as the writer has discovered, these were indeed the qualities of character which, added to his surgical skill, so greatly endeared this oral surgeon of a hundred years ago to his fellow-citizens that when he died they erected a marble shaft over his grave which described him as the good Samaritan whose death was a public calamity.

Such was the man with whom this article is concerned.

Most towns make their claims to fame in terms of the exploits and accomplishments of the military leaders, statesmen, or industrialists who have been numbered among their citizens. So Wheeling, West Virginia, like many other cities, is known to history for significant happenings there in the field of civil, political, and commercial affairs, but few perhaps are aware that the pioneering development of so important a department of human welfare as oral surgery is identified with that city in the life of Dr. S. P. Hullihen who practiced from 1835 until his untimely death in 1857.

ANTECEDENTS

Of this man's antecedents we know only that his great-grandfather came from Ireland about the middle of the eighteenth century and settled in Pennsylvania, where the family continued to live among the early pioneer settlers of the western part of that state. His father, Thomas Hullihen, grew up in that vicinity and married Rebecca Freeze, also a resident of Pennsylvania. Three boys were born to this marriage. The oldest, Thomas, who later became a judge, moved farther west, and died there. Simon, the second child, was born December 10, 1810. The youngest of the three brothers was James, whose name we find listed in the first directory of Wheeling as a dental student. James worked with his older brother and did much of the purely dental work in connection with Simon's extensive oral surgical practice.



S. P. HULLIHEN, M.D., D.D.S.
"FATHER OF ORAL SURGERY"
BORN DECEMBER 10, 1810
NORTHUMBERLAND COUNTY, PA.
DIED MARCH 27, 1857
WHEELING, VIRGINIA

The color of the ground was in him, the red earth,
The smack and tang of elemental things:
The rectitude and patience of the cliff,
The goodwill of the rain that loves all leaves,
The friendly welcome of the wayside well,
The courage of the bird that dares the sea,
The gladness of the wind that shakes the corn,
The pity of the snow that hides all scars . . .
The tolerance and equity of light.

—Edwin Markham.

Simon as a boy attended the district school of his home town and was a diligent student. He suffered a permanent lameness from severe burns to his feet and his legs below the knee, the result of a fall into a lime kiln from which he was not rescued until serious injury had been done. Even as a boy his interest in the medical career he wished to follow was evinced by his eager desire to witness the operations performed by the physicians in and near his home

WHEELING DIRECTORY.	43
Hadden, Alexander, one of the firm of Brown & Hadden, residence 32, Main street.	
Hosack, William, grocer, 11, Main street. Residence 19, John street.	
Helm & Richardson, steam engine and machine manufacturers, and iron founders, 45, Main street, corner of Quincy. See introduction.	
Helm, Henry, one of the firm of Helm & Richardson, residence 56, Centre street.	
Hutchinson & Bell, coachmakers, 69, Main street.	
Hall, R. John, innkeeper, Congress hall, 99, Main St.	
Harper, D. Samuel, Agt., wholesale and retail dealer in hats and caps, 121, Main street. Residence 132, Quincy street, corner of 6th street.	
Hullihen & Funderburg, surgeon dentists, 211, Main street.	
Hamilton, Ellen, widow, seamstress, 237, Main street.	
Haag, Thomas, laborer, 241, Main street.	
Hubber, Philip, stonecutter, 245, Main street.	
Harrison, George, clerk, 271, Main street.	
Hughes, Thomas, gunsmith, shop 19, Adams street. Residence 275, Main street. Also one of the firm of Hughes & M'Naughten, lumber merchants.	
Hoops, Mary, widow, keeps boarding house in rear of 349, Main street.	
Henderson, Stewart, blacksmith, 290, Main street.	
Hydingger, Joseph and John, laborers, 334, Main St.	
Holmes, K. James, cordwainer, and wife milliner and mantuamaker, 44, Main street.	
Hawkins, C. E., sign and ornamental painter, 108, Main street. Residence 116, 5th street, corner of Monroe street.	
Hopkins, William, barber and hair dresser, 176, Main street. Residence 72, Union street.	
Hutchinson, M. J., cordwainer, 190, Main street.	

Fig. 1.—The first Wheeling directory, published in 1839, carried the above listing. (At 211 Main Street, Dr. Hullihen's first location in Wheeling, he became the preceptor to W. F. Funderburg and James Orr, both of Pittsburgh; later these two men returned to Pittsburgh and became founders of organized dentistry in that city.)

village—a desire which he was often permitted to gratify, for the doctors of his neighborhood took a great interest in the lad. They gave him access to their medical books, which he read with a great eagerness, much to his advantage, doubtless, when he matriculated later in Washington Medical College, Baltimore, where he studied for a Doctor of Medicine degree which was granted him in 1832 at the age of twenty-two years.

ACTIVE CAREER

He commenced practice at once in Canton, Ohio. The records of his life at this particular point are fragmentary, but he seems to have gone to Pittsburgh in 1834 from Baltimore where references in his letters indi-

DR. T. TOWNSEND,
PRACTISING PHYSICIAN;
May be found at his DRUG STORE,
No. 213 Main Street.

HE makes and keeps constantly on hand wholesale and retail, his very superior CALLEGRAPHIC INK, for records and general commercial purposes. This is a very rich ink, of a beautiful blue black color, and perfectly indelible except by strong chemical agents. The ink is so rich that if the inkstand be left unstopped, especially if it be wide-mouthed, the ink will evaporate so as to become too thick to flow freely from the point of the pen, and must be diluted with water or spirits—not vinegar.

He also prepares and keeps on hand a supply of Hullihen's TOOTH-WASH. This celebrated article is one of the best ever yet offered to the public, for the cure of diseased and spongy gums, and for preventing the accumulation of tartar on the teeth, and for sweetening the breath and keeping the mouth in fine order.

Orders for quantities of either or both of the foregoing articles, or any other articles in the drug line, made direct to him, or through any of the commission houses of this city, will meet prompt attention. A liberal discount will always be made to wholesale purchasers.

J. and J. REILY,
 WHOLESALE AND RETAIL DEALERS IN
GROCERIES AND LIQUORS.
 (FOREIGN AND DOMESTIC.)
 And Country Produce Merchants,
No. 167 Market Square.

Fig. 2.—The above advertisement was taken from a page in the first Wheeling directory, published in 1839, one paragraph describing Hullihen's tooth-wash.

cate he had been lecturing in the Medical School. From this we may conclude that his stay in Canton was a very short one and that he had gone back to Baltimore, possibly as a temporary instructor in the medical school from which he had graduated. Remaining in Pittsburgh for a short time, he became acquainted with the Fundenburg family. He went to Wheeling, Virginia, on

January 25, 1835, but returned to Pittsburgh a little later to make Elizabeth Fundenburg his wife and returned to Wheeling with her in April, 1835. There he set himself up to practice oral surgery as a specialty, doing dentistry to earn a livelihood until his surgical practice increased to the point where he could turn his dental patients over to his younger brother, James, whom he had trained in the early days of his practice.

Upon his arrival in Wheeling, with characteristic decision and in defiance of the still prevailing prejudice of the medical profession of his time against an educated physician's having anything to do with dentistry, he announced his intention of specializing in the surgical treatment of diseases of the mouth and head.

This announcement seems to have been greeted with an unpleasant amount of censure—and skepticism as well. It did not seem possible that a sufficient practice could be secured in so limited a field. But this was a man who knew his own mind. He persisted in his announced intention and in a few years had so large a practice that people from far and near were seeking his advice, coming into Wheeling from all the countryside for treatment, as his reputation became more and more widely known. So great, indeed, was his success that he came in time to be looked upon as the foremost man in his field throughout the Mississippi and Ohio Valleys. Signal recognition of his growing reputation came to him, too, as early as 1843 from the Baltimore Dental College, which in that year conferred upon him the degree of Doctor of Dental Surgery, the earliest instance perhaps of such an award as an honorary degree.

From the very first, Hullihen enjoyed a confidence that few men experience with their patients. He possessed a personality and bearing that impressed all who came in contact with him; which, together with his extraordinary surgical skill, won both the admiration and regard of a very large number of patients and friends. His work, the instruments he invented, and his writings, which are included in this monograph, doubtless had their influence upon such men as Garretson, Cryer, Brophy, Gilmer, Marshall, Fillebrown, Brown, and others, who later developed the specialty of oral surgery in many of the great medical centers and by their achievements forced universal recognition of this great field of work, until professorships of oral surgery have become a necessary part of every standard medical-dental school. The first such professorship was established, only eight years after Hullihen's death, at the University of Pennsylvania under the leadership of Garretson, who did more perhaps to develop this specialty than any other one man.

INVENTIVENESS AND VERSATILITY

Though a very busy practitioner, Hullihen was for his time quite a prolific writer and the inventor of at least six ingenious and unusual surgical instruments. In some of the more than twenty articles he contributed to various journals, copies of which are still extant, these instruments are described with photographic illustrations. They were the following: uvula scissors, compound root forceps, curved fine tooth forceps, spear-shaped scalpel, needle holder, and the dumbbell-shaped cautery; not to mention certain specially designed palate

obturators and splints for jaw-fracture cases. They are illustrated in the articles that form the supplement to this paper.

A truly astonishing figure he was, bold and energetic in thought and action, possessed of zeal and ardor and of sympathy and compassion as well—a man whose surgical skill and inventiveness was such that he seems to have been deservedly described by those who knew him well as “touched with genius.”

56 DIRECTORY OF WHEELING.		
Hubbard, Chester D	f C D H & Co,	res: Chapline bl Webster, cw.
Hubbard, John R	“ “	b h, 113 Fourth.
Hubbards & Gill,	lumber mchts,	cor Main and Webster, C W.
Hubbard, William	engineer,	Vine alley above 5th; E W.
Huesman, Lewis,	inn keeper,	92 Main.
Huff, John	laborer,	Linsley above Sixth, E W.
Hughes, Alfred	lumber merchant,	393 Main; res: Centre abv 5th
Hughes, John	iron worker,	b h, Main above List, N W.
Hughes, Mary	widow,	289 Main.
Hughes, John	planing machine,	res: 318 Main.
Hughes, James	shoemaker,	Market above Jefferson.
Hughes, Thos, Jr,	merchant tailor,	36 Water.
Hughes, Maria	widow,	Centre b Fifth and Sixth.
Hughes, Patrick	laborer,	Main below Webster, C W.
Hukill, Nathan	painter,	Main above Washington.
Hughey, J C	tinner,	38 Main, C W.
Hullihen, S P	surgeon Dentist,	131 Fourth; res; 135 do.
Hullihen, James F	dental student,	b h, 135 Fourth.
Hull, William	painter,	136 Main; res: 6th bl H'm'n.
Hull, Jacob	bricklayer,	Centre b Sixth and Seventh.
Hull, Lewis	butcher,	Centre b Sixth and Seventh.
Hunter, William	cabinet maker,	b h, Market aly below Main.
Hunter, Fleming & Co,	iron manufacturers,	33 Water.
Hunter, John	f H, Fleming & Co,	res: cor Fourth and Union.
Hunter, George	nailer,	Cedar alley above 7th, E W.
Hupp, Dr John	office and	211 Main; b h, Monroe house.
Huss, Adaline	widow,	40 Water.
Husler, David	carpenter,	Centre b 6th and 7th.
Hutchins, John	chair maker,	abv Hampden, Buena Vista.
Hutchinson, Isaac	coach maker,	Centre b Sixth and Seventh.
Hutson, William	malt maker,	John b Fifth and Sixth.
Hyett, Jehu	paper maker,	Water below Fourth, C W.
Hyland, Rev W L	Episcopalian C,	65½ Monroe.

Fig. 3.—The Wheeling directory, published in 1851, carried the above listing. (James F. later migrated to Janesville where he died.)

The great versatility and breadth of skill and interest of the man is attested by the record in his diary and from other reliable sources of a range and number of operations truly remarkable in a professional career so short as his: For cataract, about two hundred; antrum, an equal number; harelip and strabismus, over ninety each; cleft palate, between fifty and sixty; cancer of face and mouth, more than a hundred; plastic operations to restore nose, lip, or underjaw, more than eighty in all; besides hundreds of general surgical operations of one sort or another.

As a citizen of Wheeling he was active in every progressive undertaking: a leader in civic enterprises of every sort; a member of the city council; a trustee of the Linsly Institute; originator of the first infirmity-hospital in our state (1845); leader in the movement for the establishment and organization of the Wheeling Hospital, where his portrait is preserved and honored as that of its founder. Farsighted, devoted to the relief of human suffering, he was a true humanitarian, and his life and work deserve to be recorded and preserved.

DR. S. P. HULLIHEN,
DENTIST,
Office No. 131, Fourth Street.

GEORGE W. MOORE,
SURGEON DENTIST,
Office No. 124, Main Street, Centre Wheeling.
ALL OPERATIONS WARRANTED.

DR. J. C. HUPP,
OFFICE NO. 211, MAIN STREET,
One Door South of Judge Fry's Residence.

DR. R. W. HAZLETT,
Office Plank Road,
SOUTH WHEELING.
FORMERLY RITCHIETOWN.

Fig. 4.—Several samples of professional listings, appearing on the front page of the Wheeling directory, 1851.

END OF A USEFUL LIFE

His death was marked by expressions in the local papers and medical journals that show the extraordinary esteem in which he was held by his fellow-citizens and his medical colleagues, as is indicated in the following excerpts:

From *The Wheeling Intelligencer*, April 3, 1857.

DEATH OF DR. HULLIHEN

Last Friday afternoon, the 27th ult., Dr. S. P. Hullihen, the noted surgeon, departed this life. His disease was a combined attack of Typhoid and Pneumonia and his illness had continued about ten days. The immediate cause of the attack was his having taken cold from too violent exposure after leaving the heated hospital rooms. . . .

C I R C U L A R .

W. F. FUNDENBERG, M. D., DENTIST, of *Pittsburgh*, respectfully announces his immediate removal to *Wheeling*, as Successor to the late **DR. S. P. HULLIHEN**, his Preceptor and Hinsman.

In arriving at this determination it is proper that DR. FUNDENBERG should frankly state the natural diffidence with which he assumes the professional duties and relations of so gifted and distinguished a man as DR. HULLIHEN. But inasmuch as it was the EXPRESS WISH of the late Doctor himself, during his last illness, that DR. FUNDENBERG should, in connection with his two eldest sons, MR. ALFRED F. and MANFRED F. HULLIHEN take this responsible position, Dr. F. feels that no choice is left him but to obey so sacred a request, from a sense of gratitude and attachment.

DR. FUNDENBERG will only add, that the two eldest sons of the late DR. HULLIHEN, have already been nearly Two Years under the Professional training and instructions of their Father, and he hopes to carry out the intentions thus commenced.

OFFICE is as usual, at No. 131, Fourth St., between Monroe and Quincy Streets, *Wheeling, Va.*

"Argus" Print.

Fig. 5.

We call his death a public calamity and we are sure our readers will agree with us. The whole community and especially the people of this city will sincerely mourn the loss which they have sustained. The death of a benefactor is always more or less a public misfortune but the loss of such a man as Dr. Hullihen, whose brilliant talents had been, with such unprecedented success, devoted to the interests of suffering and afflicted humanity, is irreparable.

Another paper describing the funeral states that the number of people that followed the body to the grave was estimated to have been over four thousand persons, such a number as had never before been seen at such an occasion.

From *American Journal Dental Science*, Vol. VII, pp. 303, 304, No. 2, 1857, Editorial 2nd series, April, 1857, Obituary.

Dr. S. P. Hullihen died on Friday, 27th March, at his residence, in the city of Wheeling, of pneumonia, after a painful illness of some eight or ten days. Few men in the walks of professional life have more fully illustrated the rare combination of high moral and social virtues, with eminent professional acquirements and most laborious devotion to science.

In no community has the death of a professional man produced a profounder grief; every citizen felt that a calamity had fallen upon his city. The poor and suffering especially felt that more than a friend had gone from them; his noble heart always beat responsive to the claims of humanity, among all states and conditions of society.

Minutes of the 3rd regular meeting of the Western Dental Society, Art. VIII, *American Journal of Dental Science*, Vol. VII, pp. 360, 361, No. 3, April, 1857, New Series.

Dr. Perrine offered resolution on the death of the late Dr. Hullihen in which the following statement occurs:

"By his superior skill and attainments, Dr. Hullihen had become a beacon light in his profession; by his usefulness and generous manifestation, he had not only endeared himself to those whom his skill had benefited, but to every member of his profession."

The distinguished Alexander Campbell wrote of him in the *Millennial Harbinger*, Bethany, Virginia, May, 1857:

His genius, science and art developed in the unprecedented and extraordinary operations performed by him in his profession have attracted the attention and constrained the admiration of the whole profession wherever he was known, from the banks of the Ohio to those of the Thames, from Boston to New Orleans.

Amongst American surgeons he had no superior, probably no equal. In dentistry he was not equaled in America. He performed operations which, when exhibited in Great Britain, constrained certain journalists to announce that such like had never been performed in Great Britain.

He was proverbially humane and generous. In his hospital as well as in his private practice he sympathized with suffering humanity in all its forms of misfortune and distress, and was ever ready to extend relief to the wretched sufferer without any other claims upon his attention than those of common brotherhood.

ACKNOWLEDGMENT

In writing this monograph it was necessary to search for information from many sources; namely, the Hullihen family records, newspaper files, libraries, citizens of Wheeling, and textbooks. I wish to acknowledge my appreciation to all who answered my inquiries, making this material available for publication. I am deeply grateful to Dr. Walter Hullihen for reviewing the notes and offering valuable suggestions for the final copy.

I am also grateful to those who offered pertinent data and encouragement, thereby making my task easier; the Frissell family; the Hullihen family; Agnes Ray, R.N.; J. Schwinn, M.D.; C. A. Wingerter, M.D.; E. L. Armbrecht, M.D.; W. F. Fundenburg, M.D., D.D.S.; Chalmers J. Lyons, D.D.S.; Robert Ivy, M.D., D.D.S.; E. C. Mills, D.D.S.; James R. Cameron, D.D.S.; T. D. Dow, D.D.S.; and lastly to my wife Helena.

ORAL DISEASES OF MEDICAL-DENTAL INTEREST

SAMUEL FELDMAN, M.D., NEW YORK, N. Y.

THERE is hardly a disease in the mouth which is not an expression of some general systemic disturbance, and there is almost no local pathologic process which is so limited that it has no repercussion at some neighboring or some distant part of the body. One cannot practice a specialty unless he possesses a fair knowledge of the entire organism, its physiology as well as its pathology. Dentistry and dermatology so often overlap that it becomes necessary for those who practice either specialty to have a clear conception of all disorders and diseases which occur in the oral cavity.

SYPHILITIC LESIONS

Perhaps the commonest of all diseases of the mouth is syphilis. This disease may attack any organ or tissue of the body, the mouth being no exception. The first sign of the disease occurs about one month after exposure to infection.



Fig. 1.—Chancre of the upper lip. Note the enlarged glands on the left side.

It consists of a hard papule which becomes eroded and is converted into a smooth red ulcer, which exudes a clear serum. Pus is never present unless the lesion becomes secondarily infected. The primary lesion of syphilis, chancre, in most of the cases occurs about the genital region, but in somewhat less than 10 per cent of the cases, the lesion is extragenital. The primary lesion may occur on the tongue, tonsils, or gums, but, by far, the greatest number of extragenital chancres occur on the lips. At times it may occur in the most unexpected locations.

I saw a girl, about twelve years old, with a chancre of the knee. She was a hat check girl and was suffering from scabies at the same time. She transferred the infection from the handling of infected clothing by means of scratching.

Read at the Sixth Annual Medical Dental Meeting under the auspices of the Joint Committee of the Medical and Dental Professions, at the Pennsylvania Hotel, Dec. 7, 1936.

A Bronx dentist was referred to me by his family physician for treatment of a condition which he diagnosed as roentgen ray burn of the wrist. It turned out to be a chancre and when I saw him, secondary lesions had developed. He had been infected by careless handling of a syphilitic patient. I treated several physicians with chancre of the fingers which they contracted by handling syphilitic patients. I can recall a case of a very young girl who had a chancre in the mouth. She was infected by means of chewing gum which was discarded by a syphilitic aunt.

Early syphilis is very infectious because the lesions swarm with the spirochetes. Innocent infection can take place from direct contact, such as kissing. Because the organisms can live for hours outside of the body, infectious material may be carried by infected utensils, such as drinking cups and dishes, or patients may be infected by the use of public telephones and toilets. The handling of infected patients by nurses, physicians and dentists is associated with the danger of transmission. The danger of syphilitic infection was once brought home to me in an unforgettable fashion. I saw a patient with a syphilitic eruption covering practically his entire body. After giving him all necessary instruction about the use of separate dishes and sleeping alone and impressing him to avoid every means of transmitting the infection to others, I reported the case to the department of health. That same evening I had the shock of my life to find the same fellow stationed as a waiter at my table in a restaurant.

The *Spirochaeta pallida*, the cause of the disease, is a corkscrew-like organism which is found in large numbers in the initial lesion, and the diagnosis of the disease by means of finding the organisms is comparatively easy. When the chancre is located in the mouth or on the tonsil, it often becomes macerated and secondarily infected so that it loses its characteristic features and becomes unrecognizable. To complicate matters still further, there are a number of harmless spirochetes usually found in the oral cavity which can be mistaken for those which cause syphilis. Spirilla so closely resemble each other that it takes an expert to tell them apart. There is one great difference, however: when the examination is made by the dark-field method, *Spirochaeta pallida* is seen moving very slowly across the field (one must not mistake the moving fluid for spirochetal movement), and the movement is described as boring or drilling, while the other spirochetes move rapidly across the field, with a movement resembling the lashing of a whip. The spirochete of syphilis also differs from most other organisms of this class in that its spirals are more regular and closer together. The microdentium is short; the macrodentium is next in size; and the buccalis is large, with irregular spirals, and is often curved.

Differential Diagnosis.—The conditions most commonly mistaken for chancre are epithelioma and herpes. In epithelioma the onset is much slower, and the lesion is much harder than in chancre and can persist for a long time without breaking down. The ulcer formed is not smooth but has an irregular base. The regional lymphatics are involved very early in syphilis, but late in epithelioma. Herpes labialis, the common cold sore, on the other hand, starts abruptly. The involvement of the glands, if present, is almost simultaneous with the appearance of the lesion. The lesion, as well as the glands, are apt to be painful. In its

early stage, when the lesion consists of a group of vesicles, a differential diagnosis is not difficult, but, when the lesion becomes later covered with a crust, a diagnosis may not be so easy. One must bear in mind, however, that herpes usually heals within a week or ten days without leaving a scar. A lesion which persists for a longer period is suspicious, and a careful search for spirochetes should be made.

Secondary Lesions.—The primary lesion, even if not treated, has a tendency to heal within four or five weeks, but by that time a secondary eruption appears on the body. This consists of copper colored macules, papules, or pustules. In the mouth there may be an eruption of grayish macerated papules, known as condyloma latum. More commonly, however, there are gray patches which look like spots painted with silver nitrate. These lesions are called mucous patches. Both forms of syphilitic mouth lesions are very infectious. Occasionally mucous patches are infiltrated, and they may be eroded. An observer with limited ex-



Fig. 2.

Fig. 2.—Mucous patches on the hard palate and moist papule at the angle of the mouth and on the lip.

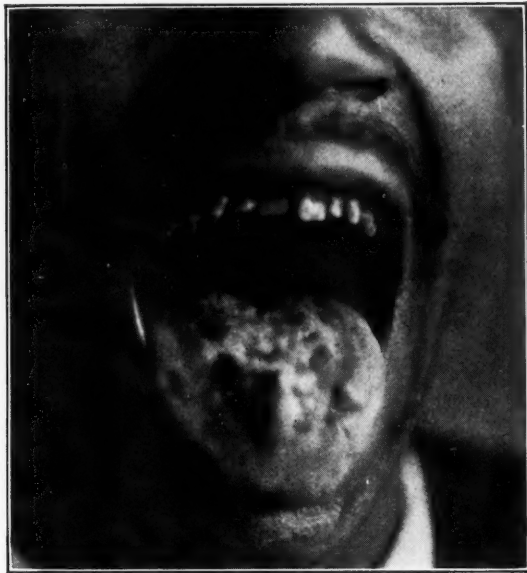


Fig. 3.

Fig. 3.—Gumma of the tongue.

perience may easily confuse them with aphthae, herpes, erythema multiforme, pemphigus, and Vincent's angina. Fissures occurring at this stage of the disease at the angle of the mouth may be mistaken for a condition known as *perlèche*.

As time goes on, one may find in patients with untreated syphilis, infiltrated patches anywhere on the mucous membrane of the mouth. These may be white and enamel-like and may be marked by furrows. Occasionally, they ulcerate and bleed. They may disappear and reappear or remain stationary. One must learn to differentiate them from the nonsyphilitic lesions of the mouth which are also seen as white patches, such as lichen planus and leucoplakia.

Fibrosis of the tongue or sclerotic glossitis occurs in late cases of syphilis. It may be primary or follow the healing of the gummas. The tongue is grooved and lobulated, it is hard to the touch, and it may be deformed. This condition is easily mistaken for a congenital malformation of the tongue, known as *scrot*

tongue. The organ is lobulated and fissured, and its surface is covered with filiform papillae, but it is smooth and entirely symptomless.

Tertiary Lesions.—The gumma is a late manifestation of syphilis, often appearing twenty or thirty years after the initial lesion. There is a swelling which has a tendency to break down and form an ulcer. This is painless and heals with difficulty, leaving a scar behind. The breaking down of a gumma may cause appalling destruction in the mouth. It may attack the jaw bones or the hard palate, causing perforation.

Differential Diagnosis.—A gumma occurring on the gum may be mistaken for an abscess and may be incised. The wound heals with great difficulty unless vigorous antisyphilitic treatment is given. A hard unbroken gumma, particularly when located on the tongue, may resemble and often is mistaken for sarcoma, and the ulcer may resemble tuberculosis or imitate the appearance of an ulcerated epithelioma, from which condition the gumma must be differ-



Fig. 4.—Tubercle of Carabelli.

entiated. It may be impossible to tell the difference between a syphilitic and a tubercular ulcer. The latter starts with a number of yellowish nodules on the palate and uvula, which nodules break down and ulcerate and may join together to form circinate figures, similar to syphilis. The base of the ulcer, however, has a granulating appearance, and the lesion is painful, while the syphilitic ulcer is not. A history of syphilis and the presence of that disease elsewhere on the body should be helpful, but a biopsy and a microscopic examination may be the only means of making a diagnosis. The Wassermann test is not reliable in these cases, for it does not always indicate syphilis, and it is not specific for that disease. It is based upon an increase of lipoids in the tissues. Some syphilitics, namely, those with very early syphilis and those with late syphilis, may not show that increase. For that reason, the Wassermann reaction is negative in a large number of early syphilitics, up to the third week of the chancre, and about 20 per cent or more patients with latent syphilis, old tertiary lesions, congenital syphilis, or syphilis of the central nervous system yield also a negative reaction. On the other hand, some nonsyphilitic diseases, such as tubercu-

losis and cancer, are capable of causing a considerable change in the lipoid metabolism, and a fair proportion of those cases may yield a positive Wassermann reaction. In addition to the above considerations, one must also bear in mind that it is not so rare to find an epithelioma starting on the border of a syphilitic ulcer. This adds to the trials and tribulations of the specialist.

Congenital Syphilis.—I am not going to burden you with a detailed description of the lesions of congenital syphilis which may occur in the mouth. Suffice it to say that any tertiary lesion may be present in congenital syphilis. The so-called syphilitic stigmas are deformities produced by a retardation of the development caused by the infection of the fetus. Prominent among them are: (1) the Hutchinson teeth, which are malformed upper central incisors of the permanent set. These teeth are separated and peg-shaped with a grooved incisor edge, a deformity due to the failure of the middle tubercle to ossify. (2) Peg-shaped teeth without notching of the incisor edge and eroded teeth, especially when accompanied by a high arched palate. (3) The mulberry molar of Fournier which has a hypoplastic crown, an irregular occlusal surface, and defective cusps. (4) The tubercle of Carabelli which is a projection from either side of the first molar.

OTHER ORAL LESIONS

A comparatively large number of other general dermatologic or systemic diseases, as well as many local diseases, involve the mucous membrane of the mouth. Some of these are benign, and others are of a more or less serious nature. The dentist is frequently consulted for these conditions, and it is important that he should have at least a working knowledge of their diagnosis and treatment.

Outside of the ordinary bacterial infections which may occur in the mouth, as anywhere on the body, there are several conditions which are due to specific microorganisms. Among them are the fungous infections and Vincent's angina.

PERLÈCHE

Perlèche starts as a grayish thickening on the mucous side of the commissure of the mouth with a wedge-shaped erythematous patch on the cutaneous side, which may be covered with scales. Several fissures are usually present at the angle of the mouth, and, on that account, the condition is often mistaken for syphilitic rhagades. Although, according to some observers, the streptococcus may cause the disease, in the majority of cases perlèche is caused by yeasts or yeastlike organisms, the *Monilia*, *Oidium* and *Cryptococcus*. It is frequently associated with moist and macerated lesions of the webs of the fingers, which are due to the same organisms and are called *erosio interdigitalis blastomycetica*. The finding of the two conditions together makes a diagnosis of perlèche almost certain. The disease yields to treatment with great difficulty, and there is a tendency to recurrence. Treatment consists of the repeated applications of silver nitrate or, better still, searing of the diseased area with the monopolar endothermy needle. It is interesting to note that on several occasions patients who were referred to me for treatment blamed some dentist for the presence of perlèche, claiming that it was caused by caustics used in devitalizing a tooth.

THRUSH

Thrush, or sprue, is another disease which is due to the above mentioned yeastlike organisms. These are round or oval and reproduce by budding. Thrush is particularly common in children. It occurs in the form of white threads which unite to form a network. Individual patches may form, or it may cover the entire mucous membrane of the mouth. The patch can be removed easily without injuring the mucosa, and there is no bleeding on removal. The condition is quite amenable to treatment in the early stage by simple antiseptics and mouth washes, but if allowed to persist for a long time, a chronic condition results which is hard to cure; and glossitis may result.

VINCENT'S ANGINA

Vincent's angina is assumed to be due to the spirillum of Vincent, which differs from the spirochete of syphilis by being longer and coarser and by having irregular spirals. It lives in symbiosis with a large spindle-shaped organism, the fusiform bacillus. The disease may start in the tonsillar crypts or on the gums, and from there it spreads to other parts of the buccal mucosa and the tongue. The resulting ulceration is usually superficial and is sometimes covered by a membrane which can be removed, leaving a raw surface. It may cause severe pain. The lesions in Vincent's angina are not characteristic, and the only means of making a diagnosis is the finding of the above mentioned organisms together. Even under these conditions, one must not be hasty in making a positive diagnosis because the pathogenicity of these organisms is not definitely proved, for they are frequently found in normal mouths, or they may be present in other pathologic conditions of the oral cavity. For example, a patient in the Morrisania Hospital presented grayish patches and ulcerations in the mouth and on the lip, which were indistinguishable from Vincent's angina. The typical organisms were found, and the patient was treated for that condition until bullae developed on his body and the diagnosis was changed to pemphigus.

The treatment of Vincent's angina consists of thorough oral hygiene and local application of arsphenamine powder or paste or intravenous injection of the same drug. Methylene blue and sodium perborate are helpful adjuvants. I obtained excellent results from the use of the Kromeyer lamp.

Next in importance to Vincent's angina are lichen planus and leucoplakia, both because of their frequency and because of the problem which they offer in diagnosis, prognosis, and treatment.

LICHEN PLANUS

Lichen planus occurs on the body as an eruption of flat, angular, violaceous papules and patches which cause extreme itching. In the mouth it occurs on the buccal mucosa on a line with the teeth. The lesions are milk-white, shiny papules which may run together to form a patch. Not infrequently, the patches are large enough to invade the buccal mucosa, tongue, gums, and lips. In certain types of the disease there is an accompanying bullous formation. These bullae may break down and ulcerate, making a diagnosis between this disease and the bullous dermatoses very difficult. The conditions for which lichen planus

is commonly mistaken are syphilis and leucoplakia. In the treatment of the latter, astringents, irritating and caustic solutions, even the actual cautery, may be used. The danger of these methods of treatment consists of the almost certain occurrence of new lichen planus lesions wherever the skin or mucous membrane of a patient who suffers from that disease is exposed to irritation. This is known as the Kuebner phenomenon. In the treatment of a case of lichen planus, the patient should be instructed to avoid all local irritants including tobacco, alcohol, and condiments. As we are dealing with a constitutional disease, systemic treatment is important, notwithstanding those who profess to cure lichen planus with mouth washes.

The urgency of oral hygiene becomes a difficult problem to the dentist when dealing with lichen planus and kindred diseases because of the extreme necessity of avoiding injury to the gums by means of dental instruments, the polishing brush, pumice, and iodine.



Fig. 5.

Fig. 5.—Lichen planus of buccal mucosa.



Fig. 6.

Fig. 6.—Leucoplakia with early epithelioma on dorsum of the tongue.

LEUCOPLAKIA

Leucoplakia occurs on the tongue and buccal mucosa in the region of the so-called smoker's triangle. It starts as a grayish or whitish patch of irregular size and shape; later it may cover the entire tongue. The papillae become obliterated, and all the natural markings and grooves of the tongue disappear. The patch may become several millimeters thick, hard, inelastic and may acquire a pearly or snow-white appearance. Fissures or verrucous protuberances may develop. Although this condition is common in syphilis, it is not strictly a syphilitic disease. The use of tobacco is the commonest cause, particularly in the presence of syphilis, and for that reason it was formerly limited almost entirely to the male sex. Now it is becoming quite common in women. Dental

caries, sharp edges of teeth, dentures, alcohol, and condiments may cause the condition in nonsmokers. Squamous cell carcinoma is the usual aftermath. It is difficult to estimate the chances for the occurrence of cancer or for recovery in any case of leucoplakia. An extensive lesion may exist for years without causing cancer, while a limited and apparently insignificant white patch may be rapidly followed by malignancy. The verrucous form apparently is the type of lesion which most commonly terminates in carcinoma. For that matter, any irregularity of the surface of a lesion of leucoplakia should awaken suspicion. It is remarkable how those whose vocation and duty it is to watch over the health of their neighbors and the community may be negligent, even willfully negligent about themselves. There are two physicians among my friends, both with leucoplakia of long duration. One developed a verrucous outgrowth which proved to be an epithelioma and paid no attention to it for a whole year on the assumption that it was merely an irregularity due to biting his cheek; the other still insists on smoking a dozen cigars a day, feeling sure that nothing will happen. By the appearance alone, it is impossible to tell whether a patch of leucoplakia is due to syphilis or not, but if simultaneously with the leucoplakia there are also atrophic patches or fibrosis of the tongue, it can be assumed that the condition is due to syphilis.

To treat leucoplakia, one must rid the patient of all sources of irritation in the mouth. When syphilis is present, vigorous antisyphilitic treatment should be instituted. One must bear in mind, however, that even under those conditions, antisyphilitic treatment alone will not cure leucoplakia. The patch itself must be destroyed by the endothermy needle. Early cases may be benefited by x-ray treatment.

BULLOUS LESIONS

Bullous lesions in the mouth offer great difficulty in diagnosis to the stomatologist on account of the great similarity of all bullous and ulcerative lesions in the mouth. In attempting to make a diagnosis, the history of the patient must be studied thoroughly, and an examination must be made with the object of finding lesions elsewhere on the skin.

HERPES

Erosions in the mouth may be due to vesicles which come and go without producing any ill effect upon the health of the individual. They may recur for years without causing any scarring. They are the counterpart of herpes labialis, fever blister or cold sore. There is usually a burning sensation. A red spot appears, and this is soon converted into a group of vesicles which rupture and leave behind a gray and macerated surface. Autoinoculation of the fresh serum obtained from one of those vesicles occasionally cures and prevents the recurrence of this disease.

HERPES ZOSTER

In herpes zoster the vesicles are arranged along the course of a nerve, one individual branch of which may be involved. The disease is unilateral and ends abruptly in the middle line of the body. This condition is frequently

preceded and accompanied by severe neuritic pains. Occasionally, the pain persists for months after the zoster lesions have healed. Many a healthy tooth has been extracted for the pain in zoster which occurred along the course of any

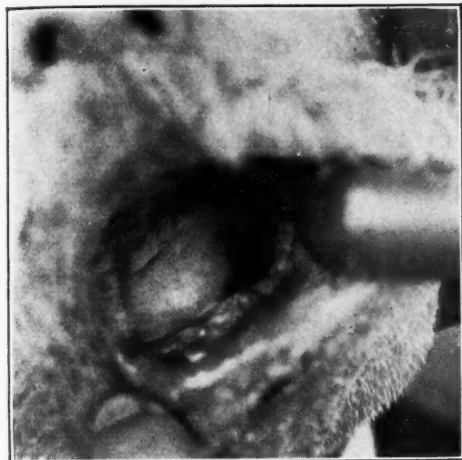


Fig. 7.



Fig. 8.

Fig. 7.—Mandibular zoster, along inferior dental branch.

Fig. 8.—The same patient with lesions following mandibular branch of the trifacial on the skin.

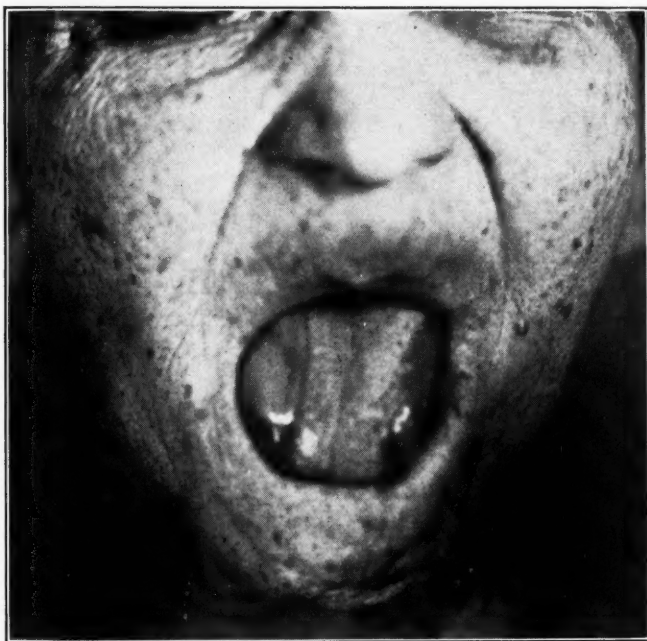


Fig. 9.—Pemphigus with large bleb on the tongue.

of the dental branches of the trigeminal nerves. I once saw a patient with early zoster prepared for a gasserian ganglion resection. This error is nothing compared with an abdominal incision for appendicitis made under similar circumstances. An injection of one-half ampule of surgical pituitrin usually checks the pain in zoster and shortens the attack.

PEMPHIGUS

Pemphigus is a constitutional disease with symptoms on the skin and mucous membranes. The distinctive feature of a pemphigus bleb on the skin is that it is flaccid and starts on a normal noninflammatory base. There may be blebs in the mouth long before the appearance of lesions on the skin, and, when that is the case, it is very difficult to diagnose the condition because all bullous lesions in the mouth look alike. Furthermore, macerated bullae on the gums are likely to be mistaken for pyorrhea. As pemphigus is a fatal disease, a mistaken diagnosis may prove to be very embarrassing to the diagnostician. Erythema multiforme and drug eruptions are common sources of error. In one patient the bullous lesions and pigmented patches in the mouth were diagnosed as phenolphthalein eruption. Although every known source of the drug was cut off, the condition continued, and finally he developed several bullous lesions on the body. Then pemphigus was suspected. He made the rounds of the clinics under that diagnosis for about four years until he was completely isolated whereupon the condition promptly cleared up. His source of phenolphthalein was presumably pink-colored cake icing. Another patient had gray, macerated lesions on the buccal mucosa and the tongue. Monilia were found in the smears, and the organisms were easily cultured from the lesions. The patient was treated for moniliasis until bullous lesions appeared on the skin several weeks later, and the diagnosis was changed to pemphigus. A careful inquiry should be made into the history of the patient who has bullous lesions in the mouth; a history of loss of weight or failing health will aid in the diagnosis.

ERYTHEMA MULTIFORME

Erythema multiforme is a constitutional disease which occurs on the skin and the mucous membranes, and, as in pemphigus, lesions in the mouth may precede those on the body. The eruption on the skin is multiform in character, consisting of erythematous patches, macules, papules, vesicles, and bullae on an erythematous base. The disease is supposed to be due to a sensitivity to bacterial proteins, and focal infections in teeth, tonsils, intestines, and female genital tract are the sources of supply of the antigen.

ERYTHEMA MEDICAMENTOSA

In all cases of bullous eruptions in the mouth a careful inquiry as to the presence of drug eruption should be made. Phenolphthalein, pyramidon, the barbiturates and their derivatives (such as luminal and alurate), the carbimids, iodine and its compounds, and a host of other drugs are capable of producing erythematous patches and bullae in the mouth as well as scarlatiniform, measlesiform, erythema multiforme-like, acneiform and bullous lesions, and the so-called fixed eruptions with the resulting pigmentation on the body. In luminal tongue the organ is denuded of epithelium and is red and shiny and devoid of papillae. In addition to the above, the barbiturates, pyramidon, and arsenic are capable of producing a condition known as agranulocytic angina with its typical blood picture, painful ulcerations in the mouth, and frequently fatal termination. Some of the chemicals used in mouth washes and tooth paste are

capable of producing violent reactions in those who are sensitive to them. The heavy metals not infrequently cause pigmentation of the mucous membrane of the gums and the buccal mucosa. Thus we have the blue line on the gums from lead, the black line from bismuth, and pigmented patches produced by these metals as well as by mercury, arsenic, and gold.

GEOGRAPHIC TONGUE

Geographic tongue is a condition in which red patches occur on the dorsum of the tongue in front of the circumvallate papillae. The tongue has a yellowish white border, and the lesion gives the impression of a broken down bleb resembling erythema multiforme. Several lesions may join to form circinate figures. This configuration changes constantly. There are no subjective symptoms outside of fear of cancer on the part of the patient. The malady may start in childhood and last through life.



Fig. 10.

Fig. 10.—Luminal eruption on the lips.

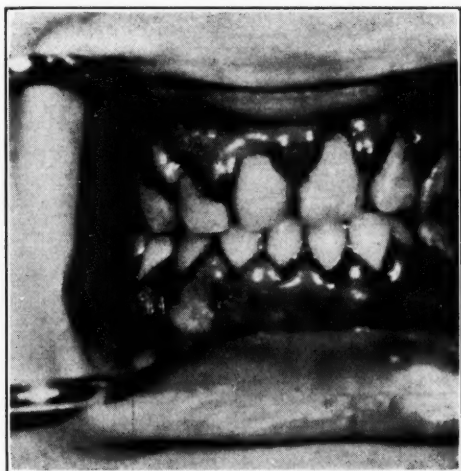


Fig. 11.

Fig. 11.—Leucemic gingival infiltration with salmon-colored gums. (Courtesy of Dr. Ziskin.)

MOELLER'S GLOSSITIS

The clinical picture of geographic tongue is imitated to some extent by a condition known as Moeller's glossitis. In appearance it is much milder. The red and shiny patch has sharp borders which are only slightly whiter than the surrounding mucous membrane. The usual locations are the tip and the sides of the tongue. The subjective symptoms are entirely out of proportion to its appearance. There is a severe burning pain, so severe that the condition has been termed by some "neuralgia of the tongue." This condition is of serious import to the patient, as it is considered a pathognomonic sign of pernicious anemia.

BLOOD DISEASES

Pernicious and severe secondary anemia, as well as other blood dyscrasias, may produce ulcerations and bleeding from the gums. In leucemia there may be an infiltration of the gums which become thickened and present a peculiar

characteristic pallor which is described as salmon-colored. Deficiency diseases and endocrine disturbances contribute their share of pathologic oral conditions, as for example the ulcerations and bleeding from the gums in scurvy and the gingivitis occurring from excess of follicular hormone in pregnancy.

CANCER PHOBIA

The fear of cancer on the part of the patient is a matter of great concern to the dentist and dermatologist, particularly in cases in which there is a constant recurrence of painful ulcerations in the mouth, an example of which is aphthous stomatitis. It starts as one or more small yellowish ulcerations which are usually surrounded by a zone of hyperemia. It may be associated with upset stomach and slight fever.

ELECTROGALVANIC LESIONS

In the region of the last molar, both on the margin of the tongue and on the buccal mucosa, painful ulcerations are often present. They may be due to rough teeth, irritating foods, alcohol, tobacco, or from improperly fitted dentures. They may be caused by electric currents produced by the various metals which the dentist uses in the mouth.

Human saliva is a good electrolyte in which metallic electrons circulate from a higher to a lower electropotential. Thus in every oral cavity which contains dentures, such as plates, bridges and fillings of dissimilar metals, there is a complete electric battery. Electrons from the strongly positive metals, as aluminum, nickel, and zinc, flow to and are deposited on the negative metals, silver, platinum, and gold. These currents cause irritation in the mouth in the form of chronic inflammation, blanched or grayish patches resembling geographic tongue, erosions and ulcers. Leucoplakia may occur adjacent to the metallic dentures. The lesions produced are not characteristic and are identical to the lesions produced by other irritants. The severity of the lesions depends upon the amount of surface of the dissimilar metals, chemical variation of the saliva, local tissue resistance, the presence or absence of other sources of irritation, and the relative position of the metals on the electromotive series. Thus zinc, because it is strongly positive to gold, will cause trouble if an amalgam filling which contains zinc is placed opposite a gold cap. On the other hand, gold and platinum are so close to one another in the series that almost no trouble will result from placing them together in the mouth.

In the limited space allotted to me, I was able to touch briefly upon some subjects in stomatology which are of interest to the dentist and the dermatologist. I am certain that others will point out some of the phases of dentistry which are of equal importance to the two specialties, and I am confident that this interchange of ideas will be beneficial to all.

DENTAL ANESTHESIA FOR CHILDREN

JOHN H. GUNTER, D.D.S., M.D., EDWARD W. BEACH, M.D., AND
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THE development of a successful practice depends greatly upon a dentist's ability to handle children and attract them to his office. This fact has been acknowledged for many years. With this in mind we come face to face with the almost universal reason for the arrival of a child in our office: a tooth-ache and the too usual necessity of removing a deciduous tooth. If we get by this first hurdle with flying colors, our future with that child is bright.

At the dental school of the University of Pennsylvania we recommend to the students the following drugs for administration to children for the removal of deciduous, permanent, or supernumerary teeth as the case may present. Nitrous oxide with oxygen or vinyl ether as inhalation anesthetics, if a general anesthetic is to be used, or procaine hydrochloride with a small amount of adrenalin added may be used if a local anesthetic is thought best.

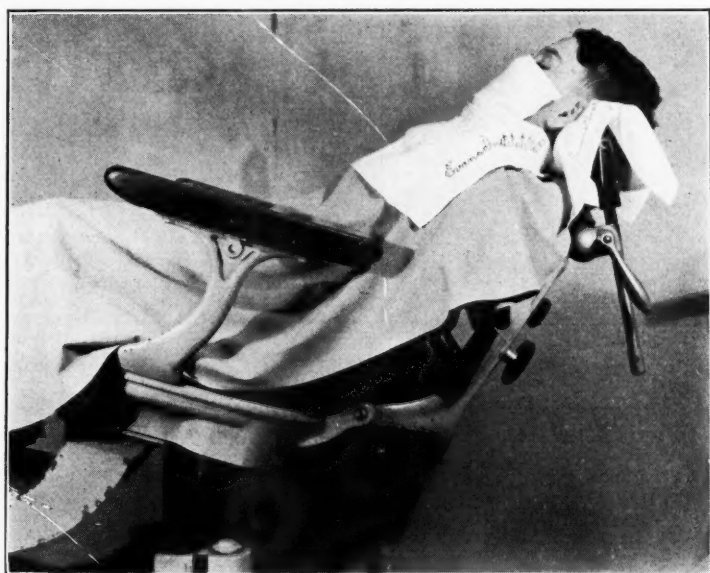


Fig. 1.—The correct position of the chair for the open-drop method of administration of vinyl ether. This method of administration will allow the vinyl ether to drop on the gauze from a vertical position.

To produce general analgesia or anesthesia we are in the habit of using, first, nitrous oxide plus oxygen; second, vinyl ether or a possible combination of both.

Nitrous oxide oxygen may be used with children in two ways: (1) as a general anesthetic, giving a complete anesthesia, rendering the child unconscious

From the Department of Maxillo-Facial Surgery, Dental School of the University of Pennsylvania.

Read before the Dental Clinic Club of Philadelphia, January 20, 1937.

or (2) by producing analgesia, that is, taking the child to the first stage of anesthesia and keeping him there during the operation. We observe a general rule that no child should be given too much nitrous oxide oxygen or for too long a period of time. The reason for this rule is that, since a child's respiratory apparatus is not as well developed as an adult's, we must be careful not to produce respiratory depression. There is often some response from the child during operation, but this is preferable to allowing him to reach a too profound stage of anesthesia. We take another precaution in administering general anesthesia by using a combination oxygen-carbon dioxide mixture of gas in the oxygen cylinder. This mixture is delivered with 95 per cent oxygen and 5 per cent carbon dioxide. This amount of carbon dioxide we find sufficient stimulation to the respiratory center to keep the breathing even.



Fig. 2.

Fig. 2.—Illustrating the separation of the gauze, the upper fold lying loosely over the nose and the mouth.



Fig. 3.

Fig. 3.—Illustrating the beginning of the administration of anesthesia by the open-drop method. Note the position of the hands and the relationship of the wick and the single layer of gauze.

We do not use premedication on children as a rule, but in some rare cases it is necessary. When this is true we use one of the barbitals or codeine in a small dosage.

An anesthesia which renders the child unconscious is used on first permanent molars and deciduous teeth which are firm in the alveolus. Sometimes, when we desire a complete ether relaxation for the removal of a supernumerary tooth, we use the nitrous oxide—oxygen—vinyl ether sequence. If the deciduous teeth are loose and easy to extract, we never carry them deeper than analgesia.

This analgesia is produced by administering sufficient nitrous oxide plus a varying amount of oxygen (from 20 to 50 per cent) to make the child semi-conscious. In order to get across the idea of semiconsciousness to the child we use the term "woozy." We ask him to tell us when he begins to feel "woozy," and this checked against the amount of time that he has been receiving the

gas will give us an idea when he has reached the state of a good deep analgesia. In a healthy child this is often accomplished with practically no difficulty in a little over half a minute.

The nasal inhaler is placed over the child's nose and he is told to "blow out" through his nose. "Blow out" through the nose is an expression used to explain to the child the term exhalation. We also believe that if we tell him this he will not be so conscious of the sensation of inhalation and will not be disturbed by the knowledge that he is "getting gas." *We also take the precaution of having the gas flowing before the nasal inhaler is placed over the child's nose, so that he is not aware of the first puff of gas when the machine is turned on.*

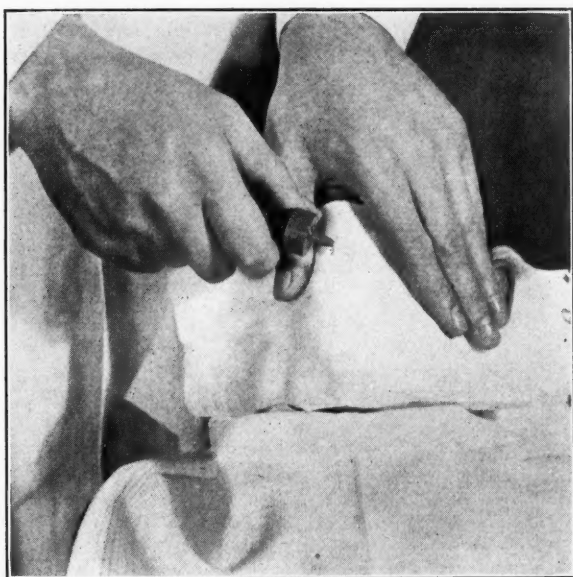


Fig. 4.—Showing the gauze now folded after the single layer has been saturated, thus preventing too rapid evaporation of the anesthetic and aiding materially in the onset of the anesthesia.

When the child reaches the analgesia stage, he will have a surface anesthesia and will open and close his mouth to allow you to remove loose deciduous teeth and roots. "Surface anesthesia" is a term which describes the sensation which a patient gets when he reaches the first stage of anesthesia, "analgesia." The person who has taken gas will recognize this loss of sensation in the toes and fingers and gradually all over the body, as one of the first changes that he became aware of during the onset of the general anesthesia.

Vinyl ether used by the open-drop method¹ gives an excellent anesthesia for children. It does not require a cumbersome apparatus which might frighten the child. Children are easily frightened by the sight of large gas machines and other apparatus, such as tanks of oxygen and nitrous oxide, nasal inhalers, and extracting instruments. In order to keep the child in a frame of mind which makes him easy to handle, it is best to eliminate all pieces of equipment which might make him fear what is going to happen. We find that the lack of

apparatus makes the administration of vinyl ether equally easy in the office or in a home. It is rapid in its onset and gives a recovery which is quick and remarkably free from nausea.

We place three layers of gauze approximately 9 by 5 inches over the child's nose and mouth. The bottle of vinyl ether should be held in the hand to warm it and it is administered by a steady open drop method until the gauze becomes saturated. The child may hold his breath after getting the first inhalation of the ether. The point is to saturate the gauze during this period. It is usually followed by a short outcry by the child and a deep breath. If the gauze is saturated, a couple of breaths are usually sufficient to relax the patient.

The use of a local anesthetic presents many difficulties when attempted on a child. If we are fortunate enough to get a cooperative child who will sit quietly while we inject a local anesthetic, procaine hydrochloride may be used



Fig. 5.—In the operative stage the gauze is folded in such a manner that the field of operation is clear and the anesthesia may be prolonged without interference with the operator. Note that there are now four folds of gauze over the nose.

by infiltration or conduction may be used if the operator is skilled in its technic. We recommend local anesthesia in cases which are temperamentally suited from a psychologic viewpoint or in those who are classed as poor risks for general anesthesia.

We believe that a 1.5 to 2 per cent procaine solution with 1 to 50,000 concentration of adrenalin is safe to use with children. For all of the deciduous teeth and maxillary first molars we recommend infiltration. The use of conduction anesthesia is limited to the first permanent molars in the mandible or whenever an inflamed area near the tooth does not permit infiltration.

We do not teach the use of ethyl chloride as a general anesthetic on children because of its so-called accumulative effect.

The properties of the following drugs make them dangerous in the hands of the inexperienced operator: chloroform because of its toxicity and depressing

effect on the heart and ethyl ether because it is unsatisfactory in ambulatory patients because of the time element and the postoperative care necessary to prevent postoperative lung complications.

SUMMARY

The suitable and judicious elimination of pain from minor surgical operations in the mouth of the child is the keystone upon which a highly successful practice may be built.

Anesthesia for children may be divided into two groups, general and local. We have the following available general anesthetics which we recommend: nitrous oxide and oxygen, and vinyl ether. Ethyl ether, ethyl chloride, and chloroform we do not recommend to the general dentist because of certain disadvantages of each. Procaine hydrochloride is a useful and safe local anesthetic in a carefully selected group of young patients.

REFERENCE

1. Gunter, J. H., Beach, E. W., and Looby, J. P.: Use of Vinyl Ether as a Dental Anesthetic, *INT. J. ORTHO.* 22: 746, 1936.

MEMBRANOUS STOMATITIS (NONSPECIFIC)

A CASE REPORT*

KURT H. THOMA, D.M.D., BOSTON, MASS.

MEMBRANOUS STOMATITIS has recently been described by Cahn¹ as a nonspecific infection of the oral mucosa causing false membranes similar to those seen in diphtheria. Hiller² reported the occurrence of similar nonspecific membranous ulcers in the pharynx. A typical case of membranous stomatitis was seen by me in the clinic of the Beth Israel Hospital. It had an added interesting feature, namely, that of recurring after treatment with a period of remission of three months.

CASE 1.—Patient, L. O'B., aged fifty-seven years, housewife, born in Canada, presented as chief complaint a very sore mouth with well-defined lesions similar to those for which she had been receiving treatment three months ago. Her local physician had called it trench mouth.

History.—Patient had scarlet fever during childhood, a pelvic operation seven years ago, a "breakdown" two years ago, lasting six months. For four or five years she had had pain in muscles and joints on and off, also noises in the ears, a disordered stomach with much gas but no vomiting or nausea. She generally has four bowel movements a day and has been having frequent catarrhal condition of nose and ears. Her best weight was 140 pounds. Her husband is dead, and four children are living and well.

Present Illness.—Three months ago the patient was seen in the dental clinic on account of sharply demarcated superficial lesions under the upper and lower lip, on buccal surfaces, posterior wall of pharynx, and under the tongue. Membranes which had formed had a white, boiled-out appearance and could be easily removed, leaving an eroded painful surface. At the same time patient had a sore spot on the left hand, caused by a "tiny watery pimple" which appeared six weeks previously. The sore spot was situated on the dorsum of the left wrist, was oval, red, scaly, and irregularly defined. A smear taken from the oral lesions showed many long chains of streptococci but no Vincent's organisms; culture after twenty-four hours' incubation showed *Staphylococcus aureus* and was negative for Klebs-Loeffler bacillus. Kahn, Hinton, and Wassermann tests were negative. The treatment for the oral condition consisted of the use of H₂O₂ spray and painting of the erosions left after removing the membranes with 2.5 per cent methylene blue. This treatment was carried out for several days. On the seventeenth day the mouth was entirely clear of the infection, and the patient was dismissed.

Three months later, the patient came back to the hospital with recurrence of the lesions. She stated that the lesions were more numerous than before, and that the mouth was very sore.

Examination.—The patient was well developed and well nourished, though of neurotic temperament and greatly upset. There was no evidence of a systemic

*From the Beth Israel Hospital, Boston.

reaction to the infection in the mouth. The mouth was entirely edentulous and the patient was wearing full upper and lower dentures. There was no mechanical irritation. The face was swollen, and on the oral mucosa there were several lesions, one on the lower surface of the tongue, a large one on the floor of the mouth on the left, two very small ones beginning on the right, and two large ones on the inner surface of the lip (Fig. 1). The lesions appear as membranes of irregular outline, slightly raised and of a grayish white color on erythematous base, producing a red margin at the periphery. When the membrane is removed, a sharply defined erosion is seen which is very painful to touch. First an allergic form of stomatitis of a dietary nature was suspected, especially because of her history of stomach complaint and a colitis which her physician had diagnosed. Experimental regulation of diet, however, brought no results.

Laboratory Findings.—Blood examination gave the following results: Red blood cells, 4,290,000; hemoglobin, 65-70 per cent; white blood cells, 5,000; polymorphonuclear leucocytes, 51 per cent; lymphocytes, 42 per cent; monocytes,

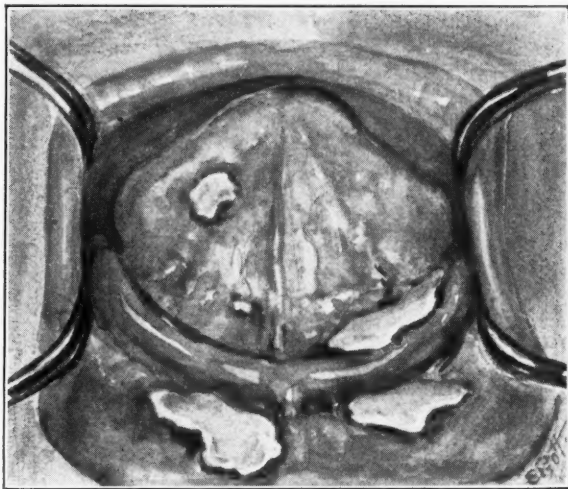


Fig. 1.

6 per cent; other cells, 1 per cent. Repeated bacteriologic examination showed streptococci and *Staphylococcus aureus*, no Vincent's organisms.

Diagnosis.—Nonspecific membranous stomatitis.

Treatment.—The same treatment given before was instituted and gave good results.

CONCLUSION

Membranous stomatitis forms false membranes on any part of the oral mucosa similar to those seen in diphtheria. When detached, they leave a bleeding surface on which the membrane soon reforms. Membranous stomatitis is due to a mixed infection with streptococci and staphylococci playing predominant rôles. Differential diagnosis for diphtheria and ulceromembranous stomatitis (Vincent's infection) is made by bacteriologic examination.

REFERENCES

1. Cahn, R. L.: Nonspecific Membranous Stomatitis, *INT. J. ORTHO.* 22: 869, 1936.
2. Hiller, B.: Membranous Oropharyngitis, *M. J. Australia* 2: 649, 1935.

TECHNIC FOR THE REMOVAL OF FRESHLY FRACTURED MANDIBULAR ROOTS

A. PORTER S. SWEET, D.D.S., HORNELL, N. Y.

THE freshly fractured root, especially when broken off just beneath the crest of the alveolus, presents a problem that is sometimes difficult. It can be solved in a number of different ways: Forceps or various pointed elevators may be used. It may be drilled out, or it may be removed by the technic I shall describe.

This technic seems to present very few difficulties. It is built around the use of the Winter exolevers, Numbers 1L and 1R, instruments designed for

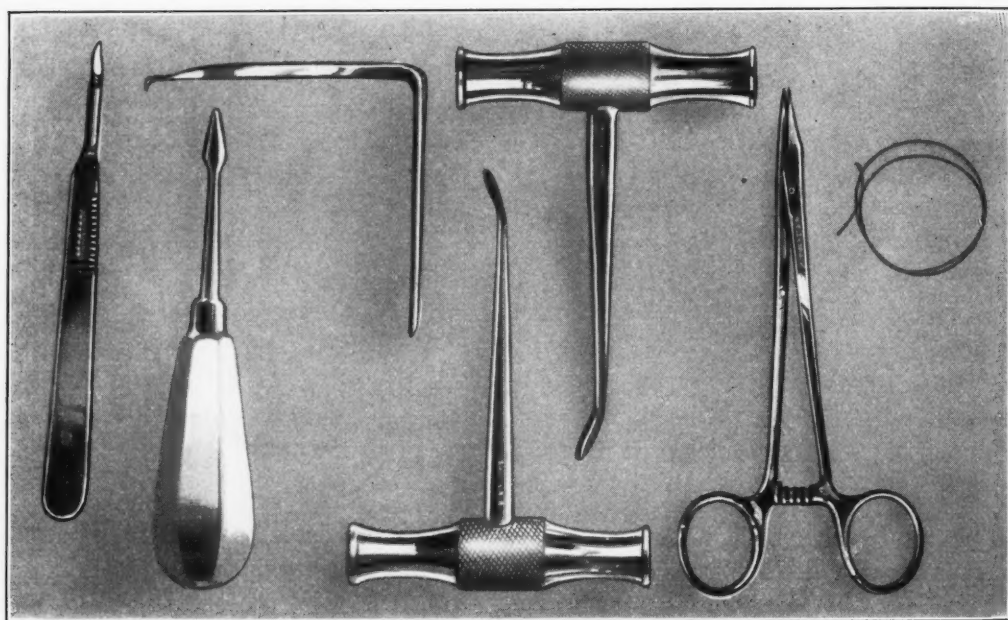


Fig. 1.

the removal of mandibular third molars. The shape of the blades and their small size make them ideal for this type of root removal. There is nothing complicated or wonderful about the technic; in fact, its very simplicity makes it all the more worth while.

The instruments needed are shown in Fig. 1. In order of use they consist of a scalpel, a periosteal elevator, a flap retractor, a large cross-cut fissure bur, the aforementioned exolevers Numbers 1L and 1R, a needle holder, a needle, and suture material. It will be noticed that the periosteal elevator shown is in reality a straight bladed extraction elevator. This instrument, with the sides and point slightly blunted, is used for flap dissection at the Mayo Clinic. The

handle fits into the palm of the hand, making it much easier to use than many instruments made especially for the purpose. The Austin retractor illustrated has been found very useful in this type of case.

Fig. 2 illustrates the technic. In the upper left hand corner, the case is shown with the fractured root in situ. In the upper right hand corner an incision has been made downward from the gingival to a point approximately three-fourths of the length of the root. In the bicuspid region one should exercise care so that the nerve is not injured at the mental foramen. As indicated, the flap has been loosened by blunt dissection and is held back by the retractor. The flap should always be made large enough so that there is a good view of the field of operation. Nothing makes for failure so much as inability to see what one is doing.

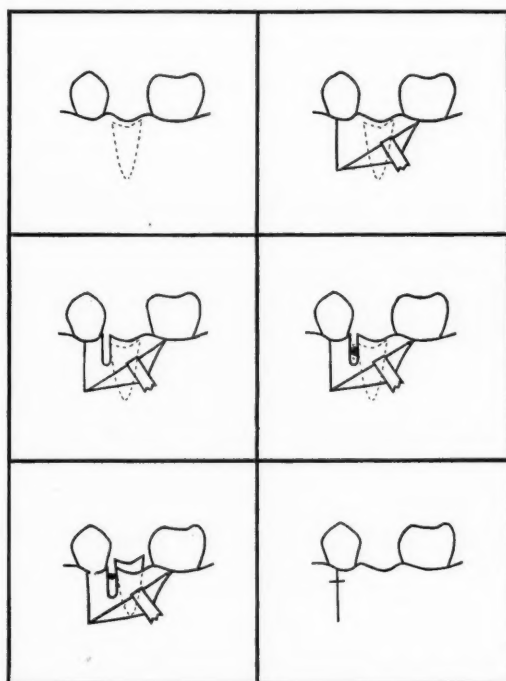


Fig. 2.

In the left center section a slot has been cut with the cross-cut fissure bur just mesial to the root to be removed.

The right center drawing shows the blade of the exolever wedged into this slot with the flat surface against the fractured root. The arrows show the direction in which the blade is rotated.

The lower left hand view illustrates the manner in which the blade bites into the side of the root and lifts it above the alveolar crest. Usually one application of the exolever will be sufficient to raise the root to a height where it can be grasped with thumb forceps. Should the first application fail to raise it high enough, the exolever should be applied again.

The last view shows the flap restored and held by a single suture.

In the drawings the depth of the slot has been exaggerated in order to show the blade of the exolever more clearly. In actual practice the slot is cut only deep enough to allow the blade to engage the root. Then, after the blade is rotated, a downward movement on the handle utilizes the bottom of the slot as a fulcrum and helps lift up the root.

I believe that there are several advantages in this technic worth mentioning. While the time factor should not be considered all important, this method does not waste time. The slot is clean-cut and relatively small so trauma is held down to a minimum. No great pressure or force is exerted or needed to remove the root, usually merely a twist of the handle. After the root has been removed, a single suture will hold the flap, and it will be found that the socket will heal almost as quickly as it would if the tooth had been removed in toto in the beginning. With so little trauma there is no more pain postoperatively than with an ordinary extraction.

EXTRAORAL RADIODONTIC TECHNIC

SIDNEY E. RIESNER, D.D.S., NEW YORK, N. Y.

THE reluctance with which the average practitioner yields from his established routine of taking only intraoral films is partly explained by his vague familiarity with a standard and recognized technic of extraoral examination. In this short series it is my intention to present a consideration of the technical factors necessary to produce the less common types of pictures, such as extraoral views of the maxilla and the mandible, including the temporomandibular joint, etc. This will offer an opportunity to those who are not familiar with the procedure to become acquainted with it. It will encourage those who regard this phase of radiodontia as requiring special skill, by showing them that it is comparatively easy if a standard, systematized routine is established. In some instances it holds greater advantages and more attractive ease than the more usual intraoral procedure.

Extraoral radiograms are primarily indicated for those regions in which a correct perspective cannot be adequately demonstrated on intraoral films. Anatomic and pathologic restrictions, as well as those of the patient's temperament, often dictate this welcome alternative to the limited and often awkward scope that intraoral examination affords.

Suspected fractures of the jaws must be examined extraorally and by a standard procedure. Thoroughness demands more than the lateral oblique position of the body of each side of the mandible, which is generally taken. For a complete report six lateral exposures are required—one of each ramus and condyle, and two of the body of the mandible on each side, and a seventh of the difficult symphysis. The latter is accomplished much better by an occlusal exposure in the intraoral method.

Too much emphasis cannot be placed on a systematic method of examination in all cases of serious head injury to determine the presence of mandibular fracture, in spite of lack of specific request from the referring doctor. It seems almost inexcusable in these days of perfected radiographic technic for fractures of the jaws or facial bones to be overlooked. However, unfamiliarity with an efficient technic for examination of the jaws, on the part of otherwise excellent operators, is a frequent cause of error.

In case of a fracture of the symphysis of the mandible, for example, the routine oblique and posteroanterior views may fail to disclose the fracture because the symphysis will be masked and obscured by the vertebrae. The only adequate way to show a fracture of this region is by means of the occlusal film placed in the mouth between the maxillary and the mandibular teeth, with the rays directed from beneath the chin. It is surprising how few practitioners appear to be familiar with this technic, or, if they are, how seldom it suggests itself to them during the examination.

Unerrupted and impacted teeth are unerringly revealed in their true positions in extraoral examination. The pneumatic sinuses are best diagnosed in this projection; no information is obtainable from intraoral films. Localization of foreign objects, such as broken needles, etc., and the demonstration of full outline of extensive pathologic areas are additional indications for the use of the larger extraoral film. Any obstruction to the placement of dental film, such as trismus, hypersensitive throat, and gagging, also warrants its choice. Finally, the investigation of vague pains in and about the ears and other neuralgias of obscure origin invites consideration of the temporomandibular joint that can be successfully demonstrated only through extraoral x-ray pictures.

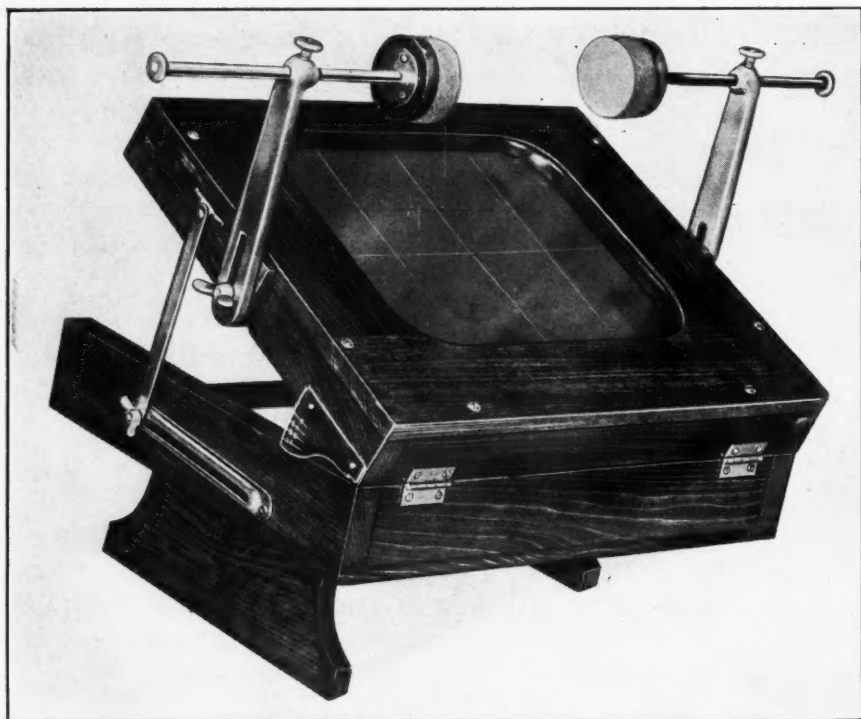


Fig. 1.—Head positioner.

To examine patients in a systematized manner, we may divide the mandible into three parts which may be investigated in an orderly procedure. The ramus with its mandibular condyle is the first region. This area yields the greatest number of unexpected findings and is not demonstrable on a small intraoral film. Because of its peculiar, comparatively fragile structure, the mandibular articulation is the site of many unsuspected fractures.

The concealed entry of the mandibular nerve and its accompanying vessels into the mandibular foramen, midway up the ramus, seems to permit the unobstructed extension of pathosis, which can be recognized in this exposure.

Here large and progressively growing follicular and radicular cysts are found extending upward in unhampered fashion. It is a favored site for adamantinomas, and small multilocular cysts find this an accommodating area to develop into the more destructive and mature lesions.

TECHNIC FOR REGION OF RAMUS

Positioning the patient for this exposure should be just a slight variant of the usual position for the body of the mandible. Here I should like to interject a plea for a more satisfactory procedure than that commonly accepted by the dental profession at large, and the one advocated by manufacturers of dental x-ray machines, as well as some authors on x-ray technic.

The uncertain practice of using the head rest of a dental chair for support has more often than not been responsible for the grotesque and distorted images we see recorded on extraoral films. Such results may have led many practitioners to approach extraoral exposures with trepidation, and have discouraged early



Fig. 2.—Exposure for region of ramus.

efforts. The practice of supporting the film holder or cassette with the patient's arm is little better, and often not so good.

If we are to expect uniform results without depending on the adaptability of the patient for the success of the picture, we must have a separate table or stand, with head clamps for fixation, to be used exclusively for extraoral radiography.

Immobility is the essence of a successful extraoral examination. A simple head positioner as illustrated in Fig. 1 has the advantage of ease of operation. A slide tunnel is provided for the cassette; complete fixation of the patient's head can be obtained, and a reflecting mirror makes exact reproduction and uniform angulation constantly available.

For an exposure in this position the patient's head is inclined forward to the limit of flexibility which causes the mandible to be moved away from the spine, avoiding as much as possible the obscuring superimposition of this structure. The surface of the head positioner is angulated 15 degrees from the horizontal. This angle is arbitrary and may be changed to suit the convenience of either the operator or the patient. It generally makes the position more comfortable for the patient, since it relieves him of the strain and tension that an absolute horizontal placement would incur. The selected angle, however, should be added to the verticohorizontal angle of projection to the film, which is 25 degrees below the perpendicular. This would make this particular exposure 40 degrees from the perpendicular. The cheek is in contact with the surface of the head positioner, and the head is turned about 10 to 15 degrees from a direct horizontal of the midsagittal plane toward the cassette (Fig. 2). The



Fig. 3.—Radiograph of molar region of mandible.

head is placed so that the center region to be x-rayed occupies the middle of the film. The Frankfort horizontal plane (from the lower border of the orbit to the tragus of the ear) should be the base line that parallels a line etched on the cassette or tunnel top; this has the advantage that duplications may be made easily and accurately in subsequent exposures.

TECHNIC FOR THE TWO MANDIBULAR REGIONS

Maintaining the anteroposterior angle of projection perpendicular to the film, we mildly rotate the patient's chin toward the film for the two remaining regions: first, the molar and, second, the premolar and canine regions. This minimizes distortion and makes the registration uniform and systematized.

For the molar region, the procedure is repeated as before with the exception that the head is turned toward the film 25 degrees from the horizontal, leaving the nose about one inch from the cassette. All other factors remain the same. The anteroposterior angle of projection is perpendicular to the film, between

the angle of the mandible and the patient's vertebral column. The vertico-horizontal angle of projection is 25 degrees below the horizontal. The cone is centered to the region of examination. With medium fast double intensifying screens and superspeed film, employing a dental type x-ray machine of relatively fixed factors (10 m.a. and 45 effective kilovolts or 65 peak kilovolts) and with a target film distance of 36 inches, an exposure of two seconds is made. Fig. 3 shows the resultant picture.

The premolar and canine region is taken exactly in the same manner as the molar region except for the placement of the head, which is rotated until the nose is touching the cassette in conjunction with the chin. The point of incidence is again between the angle of the mandible and the vertebral column. The verticohorizontal angle may be a little more perpendicular than in the two preceding exposures.

136 EAST THIRTY-SIXTH STREET

LOCATING UNERUPTED TEETH AND FOREIGN BODIES

SIDNEY E. RIESNER, D.D.S., NEW YORK, N. Y.

IMPACTIONS and foreign bodies which are opaque to the x-ray and which are buried in the bone and soft tissues about the head, particularly the maxilla and mandible, are quite common. An increasingly large number are discovered since the use of the x-ray machine in routine office practice has become nearly universal.

Locating an unerupted tooth may involve more than the discovery of its presence; the exact position of the hidden object must be determined with sufficient accuracy to permit the surgeon to proceed confidently in an operation for its removal, or for the orthodontist to determine whether it is feasible to attempt tractional recovery of the missing member of the arch.

In considering the problem from this more exacting point of view, definite orderly procedures and a systematized approach must be used by the radiologist.

Thus it is of primary importance that the object be located in three planes: the vertical presentation, to determine its height relation to other standard anatomic landmarks; the horizontal position, as related to the boundaries of the width of the head; and finally the depth, which is the most difficult to record. The point at which these three planes converge is the location of the object. Numerous methods may be employed, ranging from complicated technics and elaborate mathematical computations with mensuration tables to the simple and often questionable technics of the individual operator.

Though perhaps the best procedure conforming with the above requirements is stereoscopy, which will produce the required results with satisfaction when the technic can be employed, this paper does not deal with stereoscopic projection. By employing the registration of the hidden object in three planes, with three separate exposures, the same information can be obtained without the expensive paraphernalia that is required for stereoscopy.

THE FIRST EXPOSURE

The first exposure is the one that will show the relative height of the object. It can be demonstrated simply in the regulation unilateral exposure of the region and will determine general information, such as gross location, position, form, size of the object, as well as the height.

Figure 1 shows an inverted, unerupted canine close to a premolar at the apical third of the root. It has penetrated the nasal floor and is in close proximity to the maxillary sinus. The exposure is made as described in my last article on extraoral technic. The region suspected determines in which one of the three recommended positions the jaw is placed.

THE SECOND EXPOSURE

The second exposure will determine the position as related to the lateral boundaries of the head and will indicate the depth; it is taken in the postero-anterior position. This can be accomplished in several ways by choosing one of the classical positions for taking radiograms of the pneumatic sinuses. Since we are chiefly concerned with conditions bordering in and about the jaws, however, the most desirable exposure is the one that will present the maxilla and mandible most accurately. This position is a slight modification of the standard Waters method, which is commonly known as the "nose-chin position." The chief disadvantage in this exposure is the superimposing density of the base of the skull. The heavy occipital line often obliterates or obscures much valuable

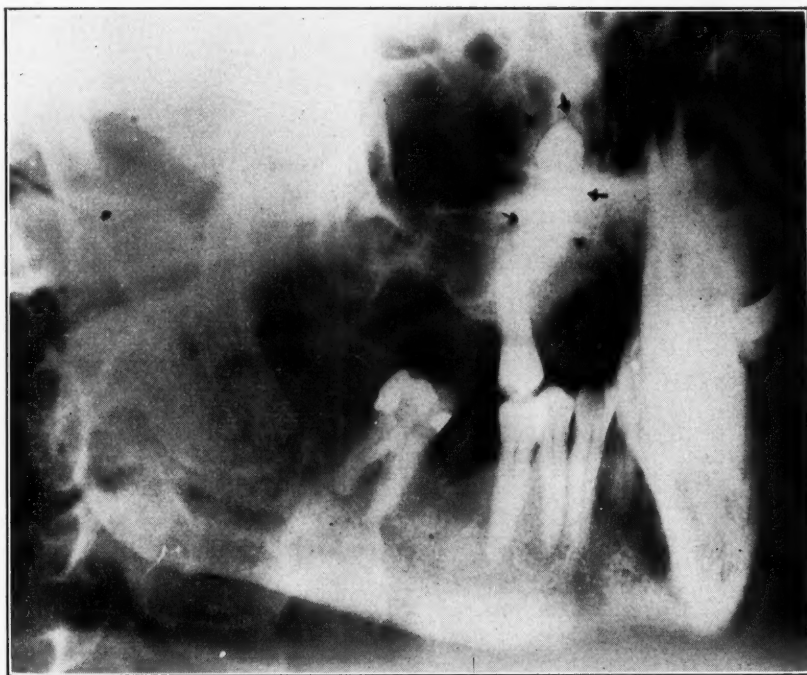


Fig. 1.—Unilateral exposure showing relative height of the unerupted canine.

information and makes interpretation difficult. The modification is accomplished with the patient posed over a cassette placed on a true horizontal base by projecting the central bundle of x-rays 25 degrees from the perpendicular upward toward the head, as is illustrated in Fig. 2. The resulting picture is shown in Fig. 3.

The picture from this position shows how far a tooth or another object is from some standard anatomic landmarks of the region. In one illustration (Fig. 3) it indicates the medial lateral relation of the unerupted, juxtaposed canine of Fig. 1 to the lateral wall and floor of the nose and the medial wall of the left maxillary sinus. It also indicates the relative vertical axis of the canine.

The factors for making this posteroanterior projection, with the smaller type of machine of the limited capacity of 10 ma. and 45 kv., most frequently found in dental offices, are as follows:

Exposure Factors for Posteroanterior Position

Anode-film distance	30 inches
Ma.	10
Kv.P.	49
Films	Eastman superspeed
Screen	Double—par speed
Time in seconds	Small—7; medium—8; large—9

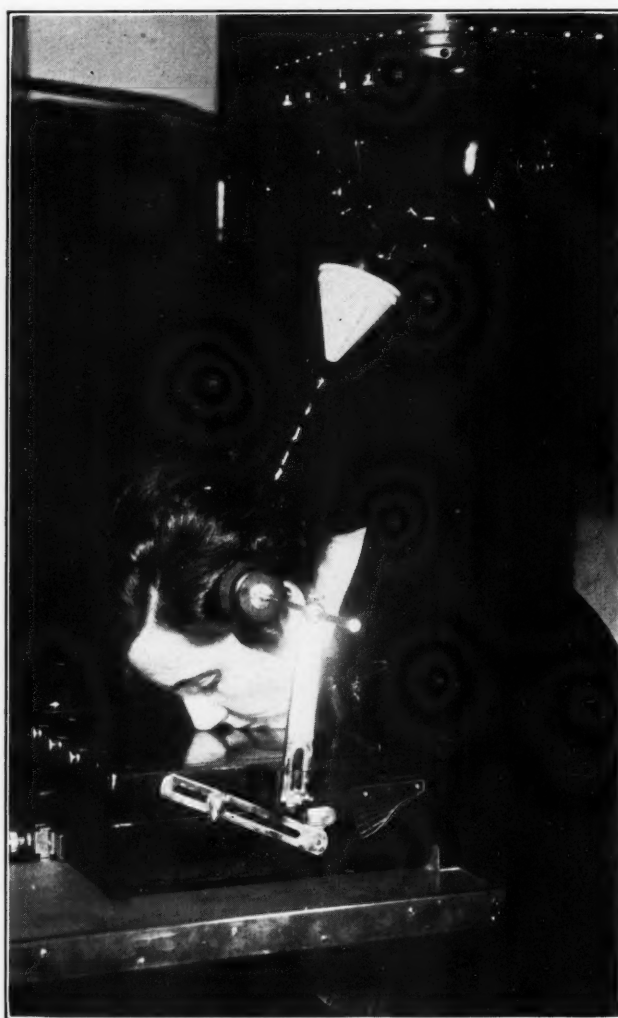


Fig. 2.—Posteroanterior position for second exposure.

Film Placement and Retention.—A sturdy head positioner with immobilizing head pads should be used. Place lead marker on corner of cassette to identify side of exposure. Long axis of films is placed vertically.

Head Position.—The patient is seated in front of the positioner. The tip of the nose is centered on the cassette. Nose and chin are touching, and the sagittal plane is perpendicular to plane of the film.

Landmark is the tip of the nose—direct cone behind occipital protuberance.

Direction of Rays.—The central rays are directed 25 degrees cephalad from the perpendicular and parallel to midsagittal plane.

THE THIRD EXPOSURE

To complete our information, localization in another plane, that of width, is essential. This is the exposure that is made in accurate lateral projection with both sides of the facial bones superimposed on one another (Fig. 4). Accuracy in centering the central beam of the energized cathode rays perpendicular to the

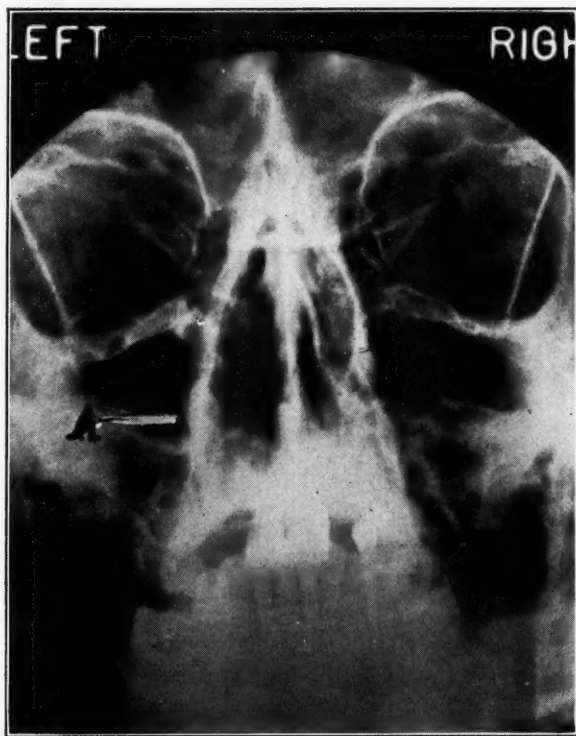


Fig. 3.—Resultant picture of second exposure.

midsagittal plane is the essential factor for the success of this exposure. This is easily accomplished if the problem is approached in a systematized and orderly procedure.

While the exposure can be made with the patient in a recumbent or inclined position, the limitation of the target-film distance will produce distortion because of the widely divergent beam that necessarily emanates from the target at the restricted distance permitted by the average dental x-ray unit. It is necessary, therefore, to place the patient in a vertical position with the head supported and immobilized as illustrated in Fig. 5. Centering one ear hole on a cross hair marked on the cassette and paralleling the other by means of the right angle marker over the external auditory meatus of the opposite side are simple and efficient means of assuring a midsagittal plane that is parallel with the plane of the film. The cone is focused by using the eminence of the zygomatic bone as

our external central landmark; the ray is directed absolutely perpendicular to the plane of the film, with a minimum target-film distance of 4 feet. If office



Fig. 4.—Accurate lateral projection.

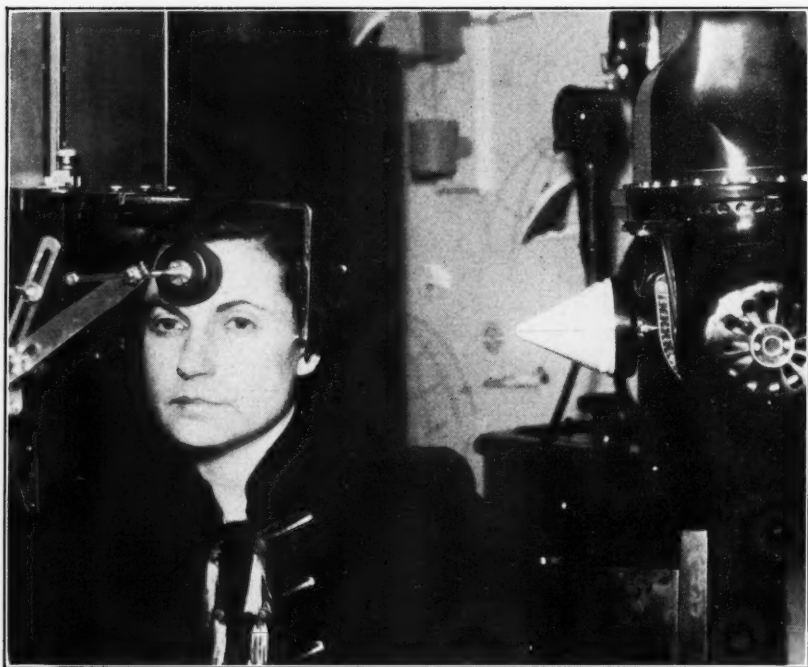


Fig. 5.—Position for lateral projection.

space permits it, a target-film distance of 6 feet is preferable. This entails a longer exposure, however, as all other factors are relatively fixed and unchangeable when using the average dental x-ray machine.

The exposure in this projection can be made to include also the soft tissues of the face. When this is desirable, put two films in the cassette and develop one a relatively short time only (two minutes at 65° F.) to bring out the fleshy profile, or keep one film wrapped in the black paper in which it is placed by the film manufacturer in order to lessen the heavy exposure by the actinic rays of the intensifying screen and to insure soft tissue detail.

Exposure Factors for True Lateral Position

Anode-film distance	48-72 inches
Ma.	10
Kv.P.	49
Film	Eastman superspeed
Screen	Double—par speed

DISTANCE	TIME OF EXPOSURE		
	SMALL	MEDIUM	LARGE
At 48 in.	4 sec.	5 sec.	6 sec.
At 72 in.	6 sec.	7 sec.	8 sec.

Film Placement and Retention.—The long axis of the film is vertical; the head is supported by the positioner.

Head Position.—The patient is seated upright; the midsagittal plane is parallel to the plane of the film as checked by the right angle ear hole marker; and the head is adjusted to the cassette so that the zygomatic bone is centered on the film.

Landmark is the zygomatic eminence.

Direction of Rays.—The central rays are directed perpendicularly, 90 degrees to the plane of the film.

USE OF INDICATORS

It is a questionable practice to insert another radiopaque body as an indicator in a known position in the suspected area as an aid in localization and to radiograph the part with this auxiliary in position. To be of any value, such indicators must remain buried in the tissues while the film is being developed, very often to the discomfort and jeopardy of the patient. It also makes for hurried opinion instead of mature and deliberate consideration because examination must be made from a wet film immediately, which procedure is not the best. In such inspection often awkward deceptions occur through appearances caused by the dripping and blurred surface of the film. Cautious and careful examination is advised, if the situation is not a pressing one.

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Practical Dental Anatomy and Tooth Carving. By Jacob R. Schwartz, D.D.S.

When we observe the individual tooth, there are a number of important features that command our attention, among them its form, quality, size and position relative to adjoining and opposing teeth. The most important of these is its form. The others are usually obvious to the trained observer.

Observation shows that in an alarmingly large number of restorations operators either are not conscious of correct tooth form or are inexcusably careless in their work. Such a work as Dr. Schwartz's is to be commended in the strongest terms both to students for whom it is primarily intended and for the careful study of the more experienced dentist.

The knowledge of tooth form is so basic that all the dental schools now have courses in tooth carving. I have known several students who have been dismissed from schools having high standards because they did not or could not grasp the importance of being able to reproduce correct tooth form. To be sure, this deficiency is usually accompanied by poor technic in other work.

A student who cannot master correct tooth form is no more fitted to practice dentistry than is a student who does not know the safe dose of narcotics and anesthetics.

This work is commendable because it shows so graphically each detail of the particular type of tooth which is being considered, the importance of each anatomical landmark, contour, marginal ridges, cusps, grooves, etc. They are all important to occlusion—in taking up the proper amount of space in the arch, shedding food that would otherwise pack between the teeth and establishing normal contacts with their antagonists. I feel this carefully prepared book should have a wide acceptance.

Albert W. Crosby.

A Dictionary of Dental Science and Art. By William B. Dunning and S. Ellsworth Davenport. Philadelphia, 1936, P. Blakiston's Son & Co.

The outstanding feature of this dictionary is the illustrations. They help to identify objects which would be incomprehensible by mere explanation through words. Anatomic and histologic terms are more easily understood in this manner. The portraits of persons conspicuous in the history of dentistry add a human interest to the book which is usually not associated with

a dictionary. If any fault could be found with the illustrations, it is the one usually found with a specially delectable morsel of food: it leaves the taste for more.

The text is complete and at the same time not too voluminous. Orthodontia, for instance, is defined as "the correction of dental irregularities by the movement of malposed teeth to correct positions; the art and science of the treatment of malocclusion." Occlusion is "the act of closing or shutting, as of the teeth—the natural closure and fitting together of upper and lower teeth; the relation of the mandibular and maxillary teeth, when closed or during those excursive movements of the mandible whereby masticating efficiency is obtained."

The strictly dental items include orthodontic and periodontic expressions, a table of microorganisms found in the human mouth, a diagrammatic reproduction of Angle's classification, and explanations of all phases of dental treatments and of dental technic.

Among the related sciences discussed are the tissues of head and neck (including comprehensive tables of muscles, nerves, arteries, and veins), many important general medical terms, chemical terms, and formulas (also a table of the elements and their characteristics). The nomenclature recommended by the American Dental Association and by the (International) Basle Anatomical Society is used. Each word is analyzed as to its derivation and definition; phonetic spelling and also synonyms are given.

For the thoughtful reader of dental literature, a dictionary of this type is indispensable. It is recommended to refresh your memory concerning famous authors, dental instruments, old anatomical names, correct pronunciation, dates of important dental events, explanation of dental or medical abbreviations, symbols in dentistry and related sciences, tests, solutions, reagents, dental materials, and diseases.

E. N.

Editorials

Federal Health Insurance Bill Is Here

Bill S-855 was introduced in the Senate on Jan. 15, 1937, by Senator Capper of Kansas, and at this writing it has been read twice and referred to the Committee on Finance. The bill is designed for aid during illness and to alleviate the loss of wages caused by sickness. It provides for compulsory as well as voluntary medical-dental services on a broad scale, involving over 90 per cent of the population of the United States.

This federal health insurance bill, if passed, will be administered and supervised by a board created by the act; the board will be the federal executive head for each state health insurance system. The system of health insurance in each state will require the approval of the federal board as to whether it complies with the conditions and provisions contained in the act; these conditions are quite definitely and specifically set forth in the bill.

The fund out of which the proposed health benefits are to be paid will be created and maintained by regular contributions equal to 6 per cent of the total of all wages paid by employers to employees. Not less than one-fourth of these contributions shall be made out of the state treasury; the remaining three-fourths may be divided between employers and employees on a sliding scale. For instance, employees receiving wages of \$20 per week or less will contribute not more than 1 per cent; those receiving in excess of \$20 but not exceeding \$40 per week will contribute amounts not greater than 2 per cent. Employees receiving wages in excess of \$40 a week shall contribute not more than 3 per cent, all of which is to be paid into a single state fund to be administered by the individual state under federal supervision.

As in the case of the Social Security Act which went into effect on Jan. 1, 1937, employees' contributions are to be deducted by employers from wages and remitted to the fund. The bill provides for the appropriation of \$200,000,000 annually to be apportioned among the states in accordance with the provisions, to aid in the development and maintenance of adequate state systems of health insurance.

The federal administration board will be composed of a director of health insurance, the chairman, and two other members appointed by the President of the United States with the consent of the Senate. In addition to this board, there will be created what is known as a federal advisory council, consisting of twelve members, all appointees of the President. Three members of the council will represent employers; three will represent employees; three will represent the professions engaged in furnishing medical and health services; and the remaining three will represent the public-at-large. It is presumed that the act will be effective immediately, in the event of its passage.

The act provides specific and detailed stipulations and conditions governing the payment of cash benefits to employees for the loss of time due to disability. Cash maternity benefits will be paid; medical benefits will be

provided for employees and their wives as well as dependent children. Other public benefits provided in Bill S-855 are:

1. The services of a physician in general practice.
2. Hospital treatment on the recommendation of attending physician.
3. Specialist's services when prescribed by physician in charge, and also laboratory services.
4. Services of dentist in general practice—in exodontia and plastic fillings as well as prophylaxis.

5. Dental restorative work will be provided when necessary to correct conditions which seriously affect the health of the patient or which may cause disability in the pursuit of gainful occupation.

As mentioned above, voluntary as well as compulsory health insurance is provided in this act. The bill is complete in each and every detail; space, however, will not permit further elaboration as to the more specific provisions as set forth in this 35-page document. Thus there looms on the social horizon a new day in medical service and all of its branches of health service. The sun rises over a scene in which professional individuality, personal identity, pride of the medical calling, like the modern trailer home, is to be hooked up to the fast-moving national parade which is passing and which introduces a new day and a new order.

No more need the professions be admonished to get ready for health insurance; it is here. Compulsory health insurance is the child born as a result of the union of the New Deal and the Social Security Act, and is well understood by economists and by those who have followed the recent social changes carefully; however the entire gesture has not yet been impressed upon the rank and file of the health professions and probably will not be for some time yet.

So it appears the warning of the Westchester Medical Bulletin, which recently appeared, was timely.

Above and beyond its present progressive efforts to improve the quality and availability of medical care, the organized profession will shortly face the greatest struggle in its history to preserve the economic foundations of its triumphant art and science against a proposal that is . . . one of the most tragically impractical "social welfare" projects ever conceived—compulsory health insurance.

If the well-earned scientific inheritance of the health professions and the drive of ambition of the calling are scattered to the four winds by humdrum and by political partisanship of administration, these mistakes are very likely to be isolated in the future, as the principal etiologic factors responsible for an epidemic of sleeping sickness to overtake the healing professions which will rob the people of their greatest birthright—the devotion of the medical profession to the oath of Hippocrates. In the new order, the healing professions will no doubt remain in spirit true to their traditions and will place service above personal gain, just as long as compulsory health insurance will permit them to keep the faith with the greater purpose in hand, which is social security and the advancement of the healing arts as contrasted with patronage politics.

H. C. P.

Missouri Dental Law

Because modern scientific medicine is an exact science and because its workers assume the scientific approach, humanity is benefited and the world is saved infinite suffering thereby. If the practice of medicine were regarded as an advertised "commodity," a thing or service for barter and trade, it would soon lose its magnificent benefaction to mankind—its humanitarianism would soon be eclipsed by commercialism, and scientific men would lose their urge for research and advancement of the greatest and most humanitarian science in the world.

Dentistry has become an important link in medical practice; a dentist discovered ether anesthesia—one of the great contributions to humanity for all time, and the discovery which made modern surgery possible. There are numerous other health service things which have originated with the dental profession.

Missouri has a new dental law which has been passed by both the House and the Senate, without a dissenting voice. Obviously the reason this excellent law has been passed so quickly and with such dispatch is that the legislature of Missouri has been convinced by dentists of that state that dentistry is an important department of medical practice and should be protected from those whose concept of practice is that of an assembly line, with a worker for every bolt.

This particular law is of great interest for many reasons. It has been in preparation for several years and reflects the sum total of an analysis of forty other state dental laws. The State Board of Dental Examiners is placed in supreme command of the practice of dentistry in Missouri. On the subject of "advertising dentists" it is the most drastic law of its kind ever placed on the statute books. It permits of no advertising whatsoever, either directly or indirectly, in order to solicit patronage. It anticipates ambitious laboratory technicians who may presume to practice dentistry in the future and provides for that.

The law provides an improved method of registering all dentists in the state, in order that all may be accounted for and "checked" at all times, by requiring that each dentist pay a \$2 license fee within one year. After the expiration of a year, the Board has the power to demand that the delinquent submit to an examination. It defines dentistry more specifically and states more clearly and conclusively the grounds upon which a dentist's certificate of registration or license may be suspended or revoked. It also prescribes further qualifications for the conduct of dental colleges and institutions and more precisely defines courses of instruction for dental students in dental schools.

A rotation process for the appointment of members to the State Board of Dental Examiners is provided: one member is to be appointed each year for a term of five years rather than an entirely new Board personnel at one time. This change insures the presence of two experienced members on the Board at all times.

There are other features of the law which are of interest. It covers fully the following: dishonorable conduct, gross ignorance, unprofessional conduct, the use of cappers or steerers, misrepresentation, fee by fraud, betrayal of professional secrets, employment of students or unlicensed dentists, deceit in advertising, superiority and price feature advertising, display advertising, glaring signs, display of teeth or plates, "painless" advertising, and the use of radio.

After review, if the Board so rules it may proceed with judgment and may revoke or suspend the license or the certificate of registration, in the case of violation of the law in relation to the above indiscretions. The judgment or order of the Board is in force until reversed or modified by the circuit court.

This comprehensive law was suggested first by Dr. Virgil Loeb, in his presidential address to the Missouri State Dental Association several years ago, and the law was carried to successful fruition through the efforts of Dr. Harry Allshouse, orthodontist, president of the Missouri State Dental Association, with the excellent support of Dr. John G. Christy, D.D.S., Speaker of the House of Representatives of Missouri, with further support of two strong committees—an energetic laws and infractions committee of the St. Louis Dental Society, consisting of Virgil Loeb, Chairman, J. C. Gordon, E. B. Owen, T. E. Purcell, O. F. Steber, J. F. Alcorn, and Earl Conner, and the legislative committee of the Missouri State Dental Association consisting of R. C. Mense, E. H. Jacobsmeyer, and O. F. Steber.

There are included the provisions of the Oregon and Illinois dental laws in regard to so-called advertisers. It provides like penalties for dentists who do not resort to advertising, but on account of dishonest practice they may be deprived of their right to practice. This latter provision is somewhat like the policy the legal profession has adopted in the last few years to purge itself in its own right of unprincipled and shyster lawyers.

In order to pass this new kind of law, the committee of the state organization, consisting of Dr. Mense, Chairman, Dr. Jacobsmeyer, and Dr. Steber, first analyzed 40 dental laws in America; this was followed by an active traveling campaign of Dr. Mense, the chairman of the committee, for the purpose of recruiting the entire force and momentum of organized dentistry in the state behind the movement.

Because the new Missouri State Dental Law is such a careful digest of some forty-odd dental laws; because it is so complete and circumscribes practically all violations of ethical dental practice; because it has received the careful scrutiny of many well-informed minds, both legal and dental; because it is regarded as one of the best dental laws ever placed on the statute books of a commonwealth; because of these reasons, and many others as well, the law will be of great interest to dentists everywhere.

H. C. P.

In Memoriam

Percy Norman Williams

1877—1937

Dr. Williams died of pneumonia at his home in Tucson, Ariz., Feb. 9, 1937, after a brief three-day illness, at the age of fifty-nine. Dr. Williams was born Oct. 27, 1877, in Maine, the son of the late Dr. J. Leon Williams,



one of the outstanding pioneers in dental history, who was widely known among anthropologists for his work with the skulls and jaws of ancient men, and who invented the "Trubyte" teeth, based on his anthropologic study and his measurements of skulls and jaws of modern men.

The younger Dr. Williams received his early education in eastern private schools, and then entered the University of Pennsylvania, from which he was graduated in dentistry. After his graduation, he went to England, where his

father had practiced dentistry for thirty years. It was while Dr. Williams was in England, studying in the London universities and specializing in children's diseases, that he became interested in orthodontia. He completed his research in England and returned to New York City to continue his orthodontic research under Dr. Hubert Jackson, one of the earliest pioneers in the field. He went into private practice in New York City.

Dr. Williams invented the odontograph, an instrument used for arch pre-determination, and within the past two years he made an improvement in this instrument which enabled him to survey in three dimensions. Three other instruments were invented by Dr. Williams.

Dr. Williams located in Tucson, Ariz., ten years ago, and opened his office there for the practice of orthodontia.

Dr. Williams was a member of the American Dental Association, the American Society of Orthodontists, the Pacific Coast Society of Orthodontists, and honorary member for life of the New York and Pennsylvania Dental Associations.

In addition to his successful pursuit of his profession, he was interested in art. He did considerable painting in oils, exhibiting in California and Arizona. He was a past president of the Tucson Fine Arts Association, and a member of the Laguna Beach Art Association.

His widow, Mrs. Lou S. Williams, a daughter, Mona Williams Boal, two sons, Dr. Robert N. Williams, of Los Angeles, and Leon, a high school student in Tucson, survive him.

Dr. Williams had prepared a paper, "The Merits of Base Metal Alloys Compared With Precious Metal Alloys," which was read before the Chicago Dental Society February 18. He had also planned to give a clinic, demonstrating his new ligature and band-forming pliers, before this meeting.

Orthodontists everywhere will mourn the loss of one more of its enthusiastic, loyal and energetic workers. Dr. Williams was a pioneer of the specialty of orthodontia in the southwestern part of the United States, a man highly esteemed by all who knew him.

V. B. Souby

1878—1937

With sincere regret the necrology committee calls attention to the loss of an honored member. On Jan. 22, 1937, Dr. V. B. Souby died after a brief illness.

Dr. Souby was born on April 2, 1878, at Del Rio, Texas. He received his early education in Texas and was graduated from Georgia School of Technology. After graduation, he was in Mexico as a railroad engineer until 1910. In this year he entered University of Tennessee Dental School and was graduated as president of his class with honors. He married Mrs. Margaret Bagwell Leatherbury, of Accomac, Va., May 25, 1911. His

early practice was in Murfreesboro and Mt. Pleasant, Tenn. He entered the army and served with distinction, and after twenty-two months' service with an injured hand, he was discharged and sent to the Dewey School of Orthodontia. Dr. Souby returned to practice orthodontia in Memphis, Tenn., and Greenville, Miss. He was associated with Dr. J. A. Gronauer.

He was a quiet unassuming gentleman. His passing is a distinct loss to our profession. He was a Mason and a member of the Psi Omega fraternity.

E. E. Francis, Jr.

W. C. Ryan

F. J. Hall.

News and Notes

THE AMERICAN SOCIETY OF ORTHODONTISTS

The 1937 meeting of the American Society of Orthodontists will be held at the Edgewater Beach Hotel, Chicago, Monday, Tuesday, Wednesday, and Thursday, April 19, 20, 21, and 22. The usual registration fee of \$10 will be required of nonmembers.

Monday will be devoted to sports. Arrangements have been made for a golf tournament at one of the good courses which is easily accessible. Trap and skeet shooting contests will be held at the Lincoln Park Gun Club, which is also conveniently located. In the evening there will be a dinner for the "big outdoor" men and any others who care to attend, after which prizes will be presented to the winners of the different events.

The banquet will be a splendid affair with music, dancing, and entertainment. A new and significant feature will be the conferring of the first Albert H. Ketcham Memorial Award.

The Scientific Exhibit Committee promises a large number of interesting and educational displays, including contributions from Northwestern University Dental School; University of Illinois College of Dentistry; Chicago College of Dental Surgery, and Samuel J. Lewis. Many others are planned.

This year we will have an exhibit of hobbies. A number of interesting hobbies and collections have been promised, and we expect to make a good showing. Bring or send us a contribution for this new feature. Many of our members are in a position to help make this exhibit a genuine success.

The commercial exhibits will occupy the entire east lounge, and you will have an opportunity to look over the new materials and instruments and to keep yourself up to date.

The Ladies' Entertainment Committee has prepared an excellent program for the enjoyment of the women. These events will include a theater party, a luncheon and fashion show, and a conducted tour of Marshall Fields'. The women are invited to participate in the Wednesday evening banquet and dance.

The hotel has made a very reasonable rate for our members and guests. Make your reservations directly with the hotel. Because of generally reduced fares, the railroads will not sell tickets on the certificate plan this year.

Let's make this a "homecoming meeting." Come and enjoy the good fellowship of your many friends. We trust you will also find the scientific program interesting and profitable.

TUESDAY, APRIL 20

Morning Session

- 9:15 A.M. Executive session.
- 10:00 A.M. Addresses of welcome.
- Dr. Arthur D. Black.
- Dr. A. Florence Lilley.
- Response. Dr. Joseph D. Eby.
- 10:15 A.M. President's address.
- Paul G. Spencer, Waco, Texas.
- 10:45 A.M. Paper: The Development of the Deciduous and Permanent Dentition From Birth to Adolescence.
- Rudolph Kronfeld, B.S., M.D., D.D.S., Professor of Dental Histology and Pathology, Chicago College of Dental Surgery, School of Dentistry of Loyola University, Chicago. (By invitation.)
- 11:45 A.M. Case reports: Orthodontic Judgment.
- Fred R. Blumenthal, Boston, Massachusetts.

Afternoon Session

- 2:00 P.M. Paper: The Influence of Function on the Growth and Development of the Lower Half of the Face.

Samuel J. Lewis, Detroit, Michigan.

The influence of function on the growth and development of the lower half of the face involves the question of the relation of function to form. In early infancy the great increase in facial volume is due to the great expansion and enlargement of the bones that make up the facial skeleton. Later this growth is due to the need for larger dental arches, increased respiratory needs, general growth of the paranasal sinuses and nasopharynx, and enlargement of the muscles of expression and mastication. Any condition or group of conditions, whether due to pathologic changes, disturbances of nutrition, or misdirection of function as expressed by certain habit movements, may alter or impede the growth pattern which nature intended for the individual.

- 3:00 P.M. Paper: Development of the Lower Half of the Face From the Viewpoint of a Rhinologist.

Harry Neivert, M.D., New York City. (By invitation.)

- 4:00 P.M. Case report: Mutilated, Bilateral Distocclusion, Showing End-Results.
Russell E. Irish, Pittsburgh, Pa.

- 4:15 P.M. Case report: Meeting the Problem Created by Congenital Absence of Maxillary Lateral Incisors.

John Rush McCoy, Los Angeles, Calif.

- 4:30 P.M. Case report: Treatment of an Adult Case.

John W. Ross, Philadelphia, Pa.

- 7:30 P.M. General clinics.

There will be a large number of interesting clinics covering every phase of orthodontics. However, as our list is not entirely complete at this time, we will not publish them in this issue.

WEDNESDAY, APRIL 21

Morning Session

- 9:30 A.M. Paper: Endocrine Aspects of the Lower Half of the Face and the Dental Apparatus.

Isaac Schour, D.D.S., Ph.D., Professor of Histology, University of Illinois College of Dentistry, Chicago. (By invitation.)

- 10:30 A.M. Case report: Cases of Class I and II Malocclusion With Endocrine Gland Involvements.

H. L. Morehouse, Spokane, Wash.

- 10:45 A.M. Paper: Clinical Orthodontic Evidences of Systemic Disturbance.

Harold J. Noyes, Chicago, Ill.

- 11:30 A.M. Case report: A Neutroclusion Case Involving Several Congenitally Missing Teeth.

Walter J. Sly, Boston, Mass.

- 11:45 A.M. Case report: Extraction of All Four Permanent Second Molars to Make Room for Third Molars.

Louis S. Winston, Houston, Texas.

Afternoon Session

- 1:30 P.M. Paper: Treatment of Open-Bite Malocclusion.

Henry F. Hoffman, Denver, Colo.

- 2:15 P.M. Case report: Neutroclusion, Treated With New Edgewise Mechanism.

S. L. Kregarman, New York, N. Y.

- 2:30 P.M. Paper: Malocclusion Caused by Macroglossia.

M. N. Federspiel, Milwaukee, Wis.

- 3:00 P.M. Executive session.

- 7:30 P.M. Banquet. At this time there will be the presentation of past-president's key and the conferring of the Albert H. Ketcham Memorial Award, followed by music, dancing, and entertainment.

THURSDAY, APRIL 22

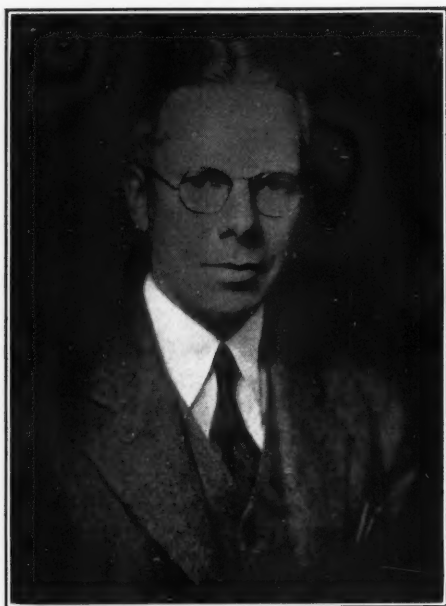
Morning Session

- 9:30 A.M. Paper: The Chemistry, Mechanics, and Metallurgy of Precious Metals Used in Orthodontia.
Reginald V. Williams, Buffalo, N. Y. (By invitation.)
- 10:30 A.M. Paper: The Structural-Functional Elements of an Ideal Occlusion.
George H. Maxwell, D.D.S., Chicago, Ill. (By invitation.)
Discussed by Howard E. Strange, Chicago, Ill.

Afternoon Session

- 1:30 to 4:30 P.M. Lecture-Clinics. These six lecture-clinics will be presented simultaneously and each will be presented three times.
1. Clinton C. Howard, Atlanta, Ga.
An informal discussion of acromegaloïd mandibular growth. Also the question of orthodontic management of growth problems as it relates to the physiologic age of the patient. X-ray hand pictures will be made, developed, and discussed.
 2. George H. Herbert, assisted by Leo B. Lundergan and Earl C. Bean, St. Louis, Mo.
Construction of appliances of chrome alloy. These appliances will be fitted to the teeth of a patient. A practical demonstration of each step in the technic.
 3. R. C. Willett, Peoria, Ill.
The reproduction of plaster casts and of anatomic hard tissues by the use of latex and by the use of agar-agar. This demonstration should be of special interest to teachers of orthodontic technic.
 4. William R. Humphrey, Denver, Colo.
A systematic approach to the diagnosis of malocclusion.
 5. Leonard T. Walsh, Pueblo, Colo.
Chrome alloy. A short discussion including the use of lantern slides, followed by a practical demonstration of the construction of orthodontic appliances.
 6. Harry B. Wright, Philadelphia, Pa.
Photography: A simplified technic for making standard photographic records, employing a new type camera.
 - a. The theory and advantage of shadowless lighting.
 - b. Method of orientating the face in the several planes of space for subsequent studies of the same individual.
 - c. Method of making photostatic photographic records in life-size dimensions.
 - d. The photography of plaster casts and inanimate objects.
 - e. The use of natural color photography for the making of lantern slides.

4:30 P.M. Final business session.



DR. LEROY MINER

Dr. Miner, president of the American Dental Association, was awarded the Alpha Omega Achievement Medal for 1936 at the Association's twenty-ninth annual convention held last December in Boston. Five hundred members and their families, representing the American and Canadian membership, attended the banquet at which the presentation was made.



To the Orthodontists of the U. S. A.

TO REPEAT the numerous and cogent arguments against operation of the orthodontic appliance laboratory would be superfluous. Protests of orthodontists against the exaggerated claims of laboratory companies appearing in dental journals are too recent to be forgotten. Notable among them is the work of Dr. T. W. Sorrels, of Oklahoma City.

In fact, most of us have been confident of much progress. The *Journal of the American Dental Association*, *International Journal of Orthodontia and Oral Surgery*, *Dental Cosmos*, and practically all of the other journals of wide circulation and high ethical standing in this country have denied advertising space to such companies. So far-reaching has been the influence of the campaign against such advertising that, on protest of organized orthodontics, some of the so-called "free" proprietary journals, which were at one time the worst offenders, finally lent their full cooperation and terminated orthodontic laboratory advertising in their pages.

A decisive victory most certainly was won for the profession when these free journals made their decision. The owners of these journals lost thousands of dollars of revenue by so doing. Let us say to the editors of the free journals that we appreciate this degree of cooperation from them.

But now we are informed by the editors of the free journals that the editors of official publications of certain state societies of organized dentistry are selling space to the very laboratories whom they have eliminated. Witness, for example, page xx in the December issue of the *Illinois Dental Journal*.

The free journal editors are registering just complaint and along with it a threat to resume operations according to their former plan unless steps are immediately taken to correct the situation.

Action must be taken at once, or the progress of the past few months will be lost to the profession and the public alike.

Are the members of the American Society of Orthodontists going to sit by and see this loss sustained, or are they going to protest the use of ethical pages for unethical and abusive purposes?

It is the duty of every orthodontist to examine the advertising in all journals of organized dentistry coming to him and to protest extravagant and false claims appearing therein. If this is not done immediately, the results of several years' work for a good cause will be lost.

George R. Moore
2105 Melrose Avenue
Ann Arbor, Michigan

The Second Summer Seminar

The second summer seminar for the study of orthodontics, dedicated to the memory of Dr. Albert H. Ketcham, will be held at the University of Colorado School of Medicine, Denver, from Saturday morning, July 17, through Sunday, July 25. Participation will be limited to twenty men who are members of the American Society of Orthodontists, or who are qualified for membership.

Lectures, demonstrations, and discussion groups are to be conducted on the same informal plan which proved successful at the first meeting. Subjects for discussion will include the etiology of malocclusion, with special reference to the constitutional background of the patient and bone pathology, diagnosis, and treatment.

Material will be presented and discussed under the leadership of Dr. Clinton C. Howard, Dr. Hermann Becks, Dr. Wm. R. Humphrey, Dr. Archie Brusse, Dr. J. Lyndon Carman, and Dr. Charles M. Waldo, with the assistance of Dr. Brooks Bell, Dr. George Herbert, Mr. Gordon M. Fitzgerald, and other members of the first seminar group.

Since much of the value of the seminar lies in intelligent discussion and since inquiry already indicates a large application list, acceptance will be based upon both priority of application and qualification of the applicant.

Communications should be addressed to the secretary.

DR. J. LYNDON CARMAN, Secretary
1558 Humboldt Street
Denver, Colo.

North Atlantic Orthodontic Society

The next semiannual meeting of the North Atlantic Orthodontic Society will be held in the Hotel Pennsylvania, New York, N. Y., Wednesday, April 21, beginning at two o'clock in the afternoon. Dinner for the essayists and clinicians will be at six o'clock, followed by the evening session at eight o'clock. All members of the dental profession are cordially invited.

EDWARD A. LUSTERMAN, Secretary
185 West End Avenue
Brooklyn, N. Y.

Ontario Dental Association

The seventieth annual convention of the Ontario Dental Association will be held at the Royal York Hotel, Toronto, Ontario, May 17, 18, and 19. Dentists from the United States and from parts of Canada outside of Ontario will be welcomed as guests.

FRED. J. CONBOY, Secretary-Treasurer
86 Bloor St. West
Toronto, Ontario.

American Society for the Promotion of Dentistry for Children

The next annual meeting of the American Society for the Promotion of Dentistry for Children will be held in Atlantic City, at the Hotel Chelsea, Monday, July 12. The meeting will begin at 9:30 A.M. All members of the American Dental Association and any members of foreign societies are most welcome to attend.

JOHN C. BRAUER, Secretary
106 Forrest Avenue, N. E.
Atlanta, Ga.

European Orthodontic Society

The meeting of the European Orthodontic Society will be held on May 17 and 18, in Brussels, at the Palace Hotel and the new Eastman Clinic. The program will include papers by Dr. Lucien de Coster, who will preside at the meeting, and Dr. Watry, Brussels; Dr. Sheldon Friel, Dublin; Dr. Georges Villain, Dr. T. Housset, Dr. C. P. Tacail, Dr. Déchaumé, and Dr. Canhapé, Paris; Dr. J. T. Quintero, Lyon; Professor Korkhaus, Bonn; Professor Simon, Berlin; Dr. Comte, Geneva; Dr. Nord, The Hague; Dr. Muzii, Rome; Dr. Rudolf Rehak, Budapest; Miss L. Clinch, Miss K. Corisande Smyth, and Mr. H. Chapman, London; Dr. Selmer-Olsen, Oslo; and Dr. Dreyfus, Lausanne.

Those planning to attend the meeting are requested to make reservations with the secretary as soon as possible.

G. F. CALE-MATTHEWS, Secretary
95 Newhall Street
Birmingham, 3, England.

Eastern Association of Graduates of the Angle School of Orthodontia

The twenty-eighth annual meeting of the Eastern Association of Graduates of the Angle School of Orthodontia was held on March 15 and 16, 1937, at the Bolton, Brush, and Associated Foundations in the anatomical laboratory of Western Reserve University, Cleveland, Ohio.

The program was as follows:

Monday, March 15, 1937

- 9:00 A.M. Registration and Scientific Sessions.
- 9:30 A.M. The Constitution of the Normal Child.—T. Wingate Todd, M.B., Manc., F.R.C.S. Eng., F.Z.S.
- 11:00 A.M. Analysis of Encroachments on the Constitution.—Carl C. Francis, A.B., M.D., Senior Instructor in Anatomy.
- Noon Luncheon—Wade Park Manor.
- 2:00 P.M. The Face of the Normal Child.—B. Holly Broadbent, D.D.S., F.A.C.D.
- 3:00 P.M. Childhood Behavior in Relation to Clinical Problems.—L. Dewey Anderson, Ph.D.
- 4:00 P.M. Tea—Hamann Museum.
- 4:30 P.M. Business Meetings.
Eastern Association of Angle Graduates—Room 38.
Edward H. Angle Society—Room 143.
- 7:00 P.M. Dinner and Entertainment—Ballroom, Wade Park Manor.
Endocrines and the African Jungle.—Daniel P. Quiring, Professor of Anatomy, Bunts Foundation, Cleveland Clinic. Instructor in Biology, Western Reserve University.

Tuesday, March 16, 1937

- 9:00 A.M. Inspection of Anatomical Laboratory and Foundations with demonstrations by the Staff of the Developmental Health Inquiry.
- 10:00 A.M. The Orthodontic Problem Associated With Allergy.—Milton B. Cohen, M.D.
- 11:00 A.M. Metabolic Variants and Their Significance in Facial Growth.—Theodore T. Zuck, A.B., M.D., Assistant Professor of Anatomy, Western Reserve University.
- Noon Luncheon—Wade Park Manor.
- 2:30 P.M. The Mineralization Problem in Orthodontia.—T. Wingate Todd, M.B., Manc., F.R.C.S., Eng., F.Z.S.
- 3:30 P.M. Bolton Standards and Technique in Orthodontic Practice.—B. Holly Broadbent, D.D.S., F.A.C.D., Director of the Bolton Study.

Notes of Interest

The district dental society of Wheeling, W. Va., wants any data or property of Dr. S. P. Hullihen, who died in Wheeling in 1857 and who was recently proclaimed "Father of Oral Surgery."

Dr. J. Wilson Harthorne announces the reopening of his office at 723 Congress Street, Portland, Me.

Dr. Harold E. Sippel announces the removal of his office to Suite 309, Curtiss Building, 361 Delaware Avenue, Buffalo, N. Y.

Dr. Francis J. Wilson announces that he has decided to retire from active practice and that his associate, Dr. Francis J. Bossard, assumed, as his successor, active charge of the office on Jan. 1, 1937.